AEROWORKS

50cc EXTRA 300LP ARF-QB

(Quick Build)

ASSEMBLY MANUAL

AEROWORKS
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TABLE OF CONTENTS

Page

Aeroworks Contact Information ……. 3

Introduction ……... 4

Kit Contents…… 5

Items Needed To Complete ……... 7

Tightening and Re-shrinking the Covering …….. 8

Check Seams and Overlaps for Good Seal ……. 9

Wing Assembly……..…….. 10

Stab and Elevator Assembly……. 14

Rudder and Pull-Pull Cable Assembly …… 18

Tail Wheel Installation ……. 26

Main Landing Gear, Gear Cuffs, and Wheel Pants Assembly ……..…… 30

Engine and Throttle Servo Installation …….. 34

Ignition Installation ……... 43

Fuel Tank Assembly and Installation……..……. 46

Radio Installation ……... 53

Muffler Installation …… 57

Cowl Installation ……. 57

Preflight Preparation ……. 62

Decal installation ……. 65

Center of Gravity (C.G.) / Control Throws ……. 69

Control Throw Deflection Table ……. 72

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Thank you for choosing the Aeroworks 50cc EXTRA 300LP ARF-QB. We put great effort into making this plane the best model you will ever build and fly. We have provided you with the highest quality kit and performance possible. We wish you great success in the assembly and flying of your new Aeroworks 50cc EXTRA 300LP ARF-QB.

!WARNING!

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and property damage. Fly only in open areas, and AMA (Academy of Model Aeronautics) approved flying sites. Follow all manufacturer instructions included with your plane, radio, servo's, batteries and engine.

Aeroworks manufacturing guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. In no case shall Aeroworks liability exceed the original cost of the purchased kit. Further, Aeroworks reserves the right to change or modify this warranty without notice.

In that Aeroworks has no control over the final assembly or materials used for final assembly, No liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

We, as the kit manufacturer, have provided you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and fly ability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expresses or implied as to the performance or safety of your completed model.

INTRODUCTION

Your new 50cc EXTRA 300LP ARF-QB is a highly aerobatic airplane. It is capable of both precision and 3-D maneuvers. The aircraft builds easily, quickly, and precisely due to its state of the art CAD design, LASER cut technology, and high quality included hardware. We hope you enjoy building and flying your 50cc EXTRA 300LP ARF-QB.

Great care has been taken in both the design and manufacturing of the 50cc EXTRA 300LP ARF-QB to allow for the strongest and lightest construction possible. Only the highest quality materials from the covering, paint, wood and hardware have been used in the construction of this model.

The 50cc EXTRA 300LP ARF-QB has been individually hand built, covered and painted by trained and experienced craftsmen with over 25 years of manufacturing experience. Using CAD design, laser cut technology and jig-built assures accuracy in all stages of production.

The 50cc EXTRA 300LP ARF-QB is designed for gas engines in the 50cc category. The Desert Aircraft 50cc engine is shown in the assembly instructions. The aircraft was tested with the Desert Aircraft 50cc and has outstanding performance. The final choice of engine is left up to the builder. A computer radio is recommended to allow the pilot to take advantage of the full capabilities of this aerobatic aircraft.

IMPORTANT Please read through this manual carefully, before starting the assembly of your new 50cc EXTRA 300LP ARF-QB . Inventory and inspect all parts and hardware for any imperfections or damage. Notify **Aeroworks immediately** if there are missing or damaged parts.

INTENDED USE

This plane should not be regarded as a toy. This is an aerobatic plane and is recommended for pilots who are beyond the trainer-stage and are comfortable with flying an aerobatic sport plane.

!READ! *WARRANTY* *!READ!*

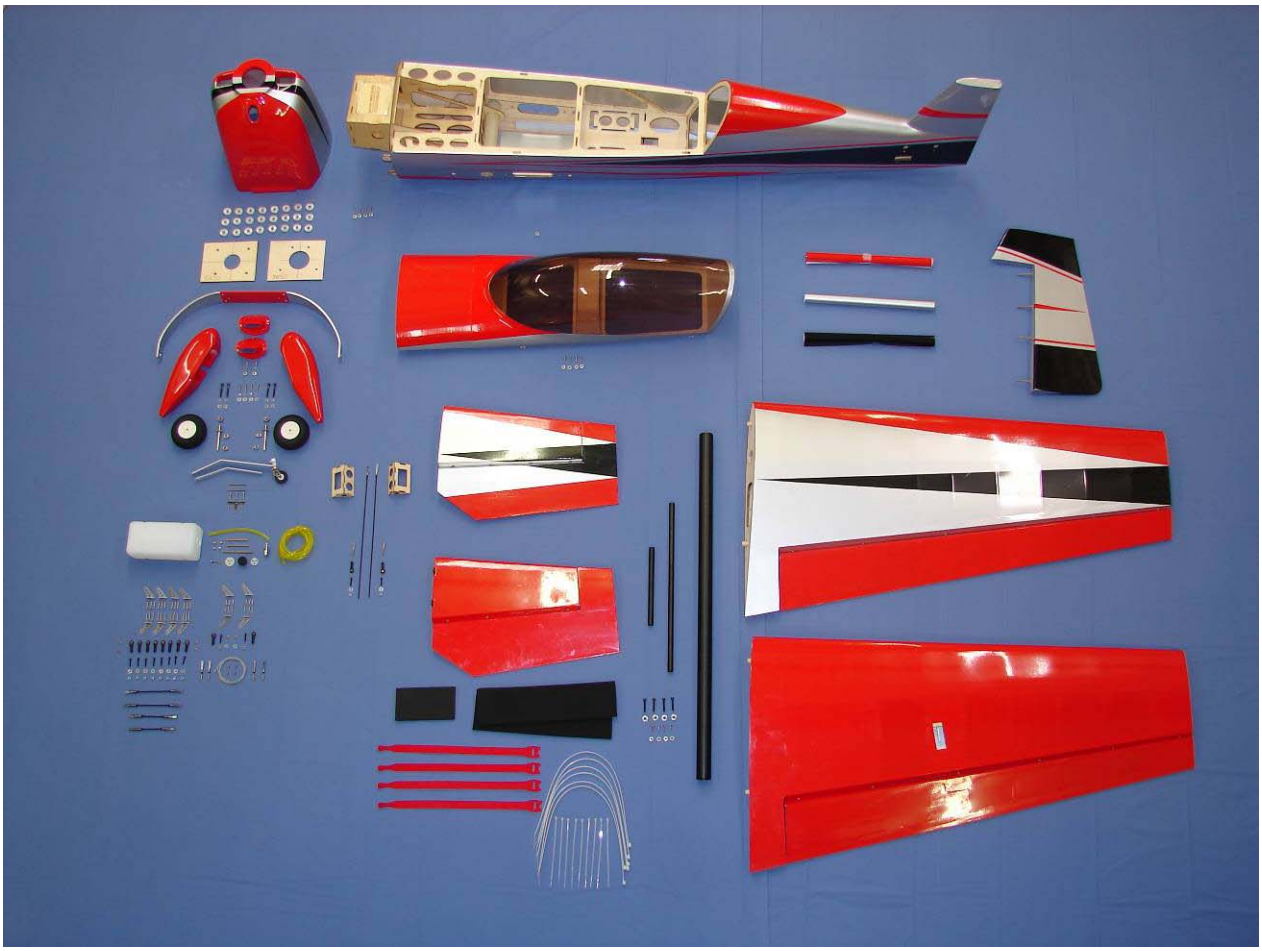
It is important to notify Aeroworks of any damage or problems with the model within 30 days of receiving your airplane to be covered under warranty. All returned parts must be shipped in their original shipping boxes and insured for full replacement value. If you wish to return this aircraft for any reason a 15% restock fee will be charged to the customer. In addition the customer is responsible for all return shipping cost and all prior shipping cost will not be refunded. Parts will be fixed or replaced once the original item is returned at the owner's expense. It is the decision of Aeroworks if the item is to be replaced or repaired.

Aeroworks cannot insure the skill of the modeler and can not influence the builder during the construction or use of this aircraft, and therefore, will not be accountable for any property damage, bodily injury or death caused by this aircraft.

Aeroworks cannot insure the skill of the modeler and can not influence the builder during the construction or use of this aircraft, and therefore,

The purchaser/operator accepts all responsibility of any and all structural or mechanical failures.

KIT CONTENTS



50cc Extra 300LP ARF-QB Materials List

Basic Aircraft Parts

Fuselage with pre-installed vertical fin – covered, Pre-installed and fuel-proofed firewall, pre drilled for the rudder hinges and tail wheel assembly.
(4) 8-32 blind nuts installed for main landing gear
(4) 4-40 blind nuts installed for the mounting the stab.
(4) 4-40 blind nuts installed for the mounting of cowling.
(1) Canopy base—painted with (4) 4-40 blind nuts installed
(1) Tinted Canopy—glued on the canopy base and painted, installed on the fuselage by (4) 4-40 x 14 mm hex style bolts
(4) #6 bonded washers for the mounting of the Canopy
(2) pull-pull exit tubes for rudder cable installed
(1) Antenna Tube installed
(1) Engine box hatch cover, installed

Left Wing with Aileron – covered: pre drilled for control horn mounting
(2) 8-32 blind nuts installed for the wing mounting.
(2) Aluminum locater pins installed, pre drilled for cotter pin
(6) pin point hinges installed and glued
(1) Aileron servo string installed

Right Wing with Aileron – covered: pre drilled for control horn mounting
(2) 8-32 blind nuts installed for the wing mounting.
(2) Aluminum locater pins glued, pre drilled for cotter pin
(6) pin point hinges installed and glued
(1) Aileron servo string installed

Horizontal Stabilizer with elevator assembly with (8) pin point hinges (glued)---covered, pre-drilled for control horns.

Rudder with (4) pin point hinges (not glued) – covered, pre-drilled for control horns.

SUB ASSEMBLIES

#1:
(1) Fiberglass Cowling—painted with (2) screw holes
(4) 4-40 x 15mm hex style bolts for mounting cowling
(4) 3mm split lock washers for mounting cowling
(4) #6 bonded washers for mounting cowling.

#2:
(1) 4mm 7075 Aluminum Main Landing Gear -- painted
(2) 5x45mm Axle Bolts
(2) M8 lock nuts
(4) 5mm i.d. Wheel Collars with set-screws
(2) 85mm (3.5") Dia. Main Wheels (Lite Type)
(4) 4-40 x 14mm hex style bolts for mounting wheel pants
(4) 3mm flat washer for mounting wheel pants
(4) 3mm split ring lock washer for mounting wheel pants
(4) 8-32 x 25mm hex head bolts for mounting main landing gear
(4) 4mm flat washers for mounting main landing gear
(4) 4mm split ring lock washers for mounting main landing gear.

#3:
(2) Wheel Pants—1 Left and 1 Right---Painted
(4) 4-40 blind nuts installed on the wheel pants, 2 per side.
(2) Gear Cuffs - pre mounted - painted. 1 left, 1 right
(2) 4-40x10mm bolts - cuff mounting
(2) #6 bonded washers

#4:
(1) Tail Wheel Assembly – medium

#5:
(1) 32mm O.D. Anodized Aluminum Wing Tube
(2) 12.5mm O.D. Anodized Aluminum Stab tubes (one front and one rear).
(4) 8-32x25mm Hex head bolts for wing mounting
(4) #8 bonded washer for wing mounting
(4) 1.8mm hair pin for wing security - attachment
(4) 4-40x10mm Hex head bolts for stab mounting
(4) #6 bonded washers for stab mounting

#6:
(2) 4-40 3" two end threaded pushrod with nuts for ailerons
(2) 4-40 4" two end threaded pushrod with nuts for elevators.
(2) 4-40 x300mmThreaded pushrod - throttle and choke.
(2) 4-40 solder coupler - throttle and choke
(2) 4-40 metal clevis - throttle and choke
(4) 4-40 ball links - throttle and choke

#7:
(2) 1x920mm plastic coated pull-pull steel cable.
(4) 3.5x5mm brass pull-pull swaging tubes
(6) AW double control horns
(24) T2.6X16mm Phillips head mounting screws
(12) T2.6X12mm Phillips head mounting screws

#8:
(1) 750cc (25 oz) Fuel Tank assembly - Fuel
(1) 450cc (16) Fuel Tank assembly - Smoke
(1) Fuel stopper
(1) 4' large gas fuel line
(4) Brass Barbs

#9:
(2) Servo mounting plates (throttle and choke)
(3) Engine mounting template (DA50, 3W50 and blank for universal mounting)
(1) 160x70x6mm foam for the Fuel tank.
(1) 140x70x6mm foam for fuel tank
(2) 300x80x8mm foam for the receiver and battery
(10) 4x 150mm Nylon Ties
(6) 8x450mm Nylon Ties
(4) 12.5x356mm Velcro One Wrap Straps
(1) 8" x 11" paper material for cutting cowl
(6) Rubber grommets– fuel line and wire guide

#10
(12) 4-40 ball links / ailerons - elevators - Rudder
(10) Brass spacers
(10) Flat washers

#11
(1) Covering - White or Silver (small patching or repair)
(1) Covering - Pearl Blue or Red (small patching or repair)
(1) Covering - Black (small patching or repair)
(1) Transparent covering - (sealing hinge gaps)

#12
(1) AW - Custom Throw Meter
(1) AW - Custom Rudder Throw Meter

#13
(1) Assembly Manual with picture folders on CD

#14
(1) Custom Vinyl decal set

#15
(24) 6mm Aluminum engine stand offs

ITEMS NEEDED TO COMPLETE

Hardware:

- 50cc Gas engine and ignition
- Standard or Pitts style muffler **(Pitts Recommended)**
- Engine mount, mounting bolts, lock nuts, and flat washers.
- 4" Spinner and propeller of choice
- 2 x aileron servos (min 180 in./oz. Torque @ 6 volt, Digital, Metal Geared)
- 1 x rudder servo (min 180 in./oz. Torque @ 6 volt, Digital, Metal Geared)
- 2 x elevator servos (min 180 in./oz. Torque @ 6 volt, Digital, Metal Geared)
- 1 x throttle servo (Fast / Reliable)
- 1 x choke servo (Fast / Reliable) **optional**
- Servo extensions 4 x 6," 1 x 12", 2 x 24"
- 1 x 6 channel receiver (PCM recommended)
- 1 x receiver battery (min 6.0 volt / 1700ma)
- 1 x ignition battery (min 4.8 volt / 1700ma)
- 2 x switches with charge jacks

Tools:

- Allen wrenches US and Metric.
- Dremel cutting disc and sanding drum tool
- Electric drill and selection of bits
- Razor saw
- Flat head screwdriver
- Hobby heat gun
- Hobby iron and covering sock
- Masking tape
- Modeling knife
- Needle nose pliers or crimping tool
- Paper towels
- Pen, pencil or felt tipped marker
- Phillips screwdriver
- Rubbing alcohol
- Ruler and tape measure
- Scissors
- T pins
- Waxed paper
- Wire Cutters

Adhesives:

- 15-30 Minute epoxy
- Blue Loctite
- Epoxy mixing cups, mixing sticks, brushes
- CA kicker (optional)
- Thick, Thin and Medium CA
- Rubbing alcohol
- Wipes

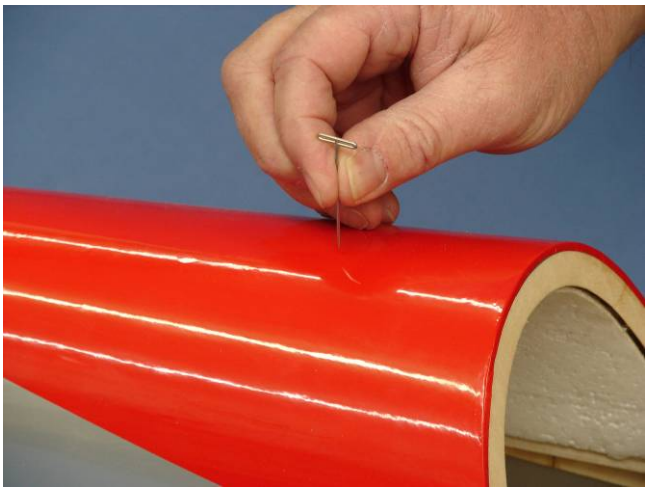
WARNING
Some rubbing alcohols may attack painted parts.

TIGHTENING AND RE-SHRINKING THE COVERING

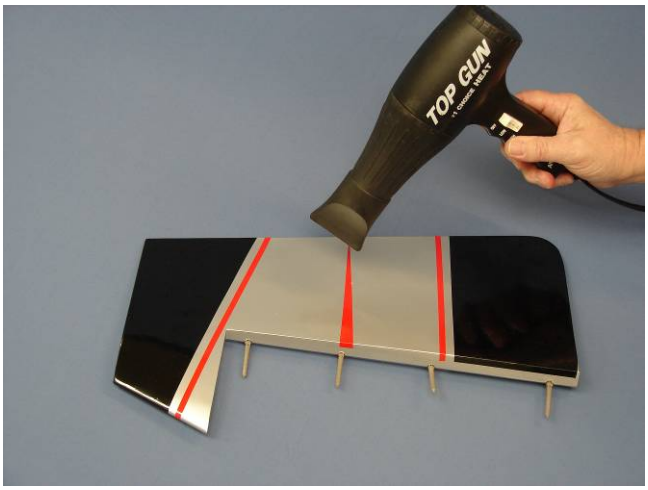
1. Open your kit slowly and take care not to damage any parts of the kit. Remove all parts from their plastic protective covers for inspection. Before doing any assembly or installation of any decals it is very important to re-shrink or re-tighten the already applied covering. Due to the shipping process, heat and humidity changes from different climates, the covering may become lose and wrinkle in the sun. If you take the time to re-tighten the covering, you will be rewarded with a long lasting beautifully covered model.

2. Using your covering iron with a soft sock, gently apply pressure and rub in the covering. If any bubbles occur, your iron may be to hot. Reduce heat and work slowly.

3. If bubbles persist, use a small pin to punch holes in the bubble to relieve trapped air and reheat.



4. Use your heat gun with extreme caution. Take care not to apply too much heat to one area for long periods of time. This may cause the trim colors to over shrink and pull away leaving unsightly gaps on the color lines. The trim stripes are especially vulnerable to over shrinking.



5. Your model is covered with Ultracote™ covering. In case of repairs, the colors are:

Red / Silver Scheme		Blue / White Scheme	
True Red	#866	Pearl Blue	#845
Silver	#881	White	#870
Black	#874	True Red	#866

Tightening and re-shrinking the covering is a never ending process and needs to be checked after each flying secession.

CHECKING SEAMS AND COLOR OVERLAPS FOR GOOD SEAL

1. Go over all seams and color overlaps with your sealing iron.

Note: Even if your models covering has no wrinkles out of the box it is still very important to go over all seams and overlaps to make certain they are sealed securely. This is especially important at the leading edges of the wings and stabs. We recommend checking the covering after each flying session.

2. Use your covering iron to ensure all edges, seams, and color overlaps are securely sealed.

3. This is an optional step but is recommended.

   Cut strips of clear covering to fit the hinge gaps. Use covering iron to seal the clear covering snugly into the bottom of the hinge lines as shown for air tight hinge seals.

IMPORTANT:

It is the purchaser / user responsibility to check the covering seams and overlaps for security and a good seal. Aeroworks is not responsible for failure of covering seams or overlaps during flight.

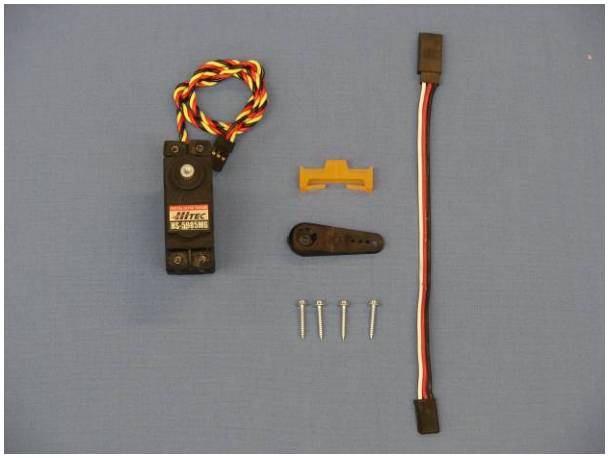
This is a never ending process that must be done after each flying secession. Due to varying temperatures and humidity changes from day to day the covering will continue to loosen and must be maintained.

WING ASSEMBLY

Aileron Servo Installation

1. The ailerons have been pre-hinged and glued to the wing panels and are ready for flight. No other steps are necessary for hinging.

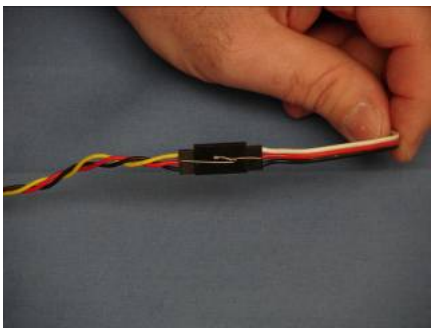
   Gather one wing panel, one aileron servo, servo mounting screws, 1 1/4" servo arm , safety clip and one 6" servo extension as shown below for preparation of the servo installation.

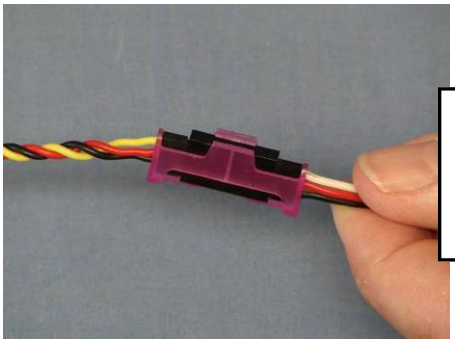


2. Layout the servo on the wing to test fit the installation and ensure servo lead is the correct length.

Note: 180 in. oz. digital, metal geared servos are recommended. Servo selection can be the difference between a great flying model and a model that will crash. Always use brand name high quality servos.

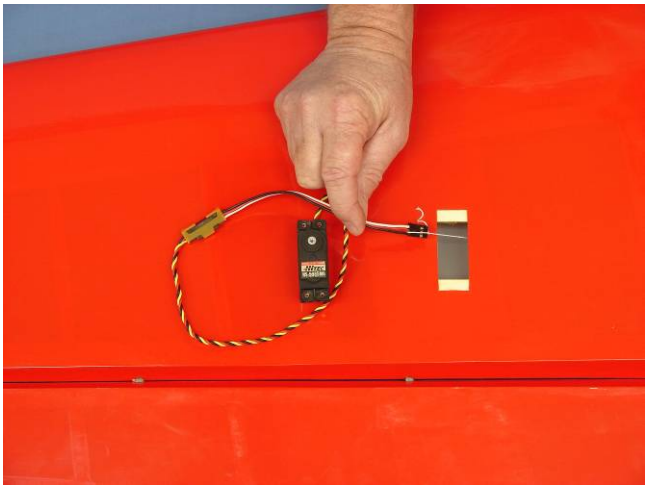
3. Attach the 6" extension to the servo lead and secure with Safety Clip, safety wire, tape or other method. Ensure the plugs will not come apart from vibration or light tension.





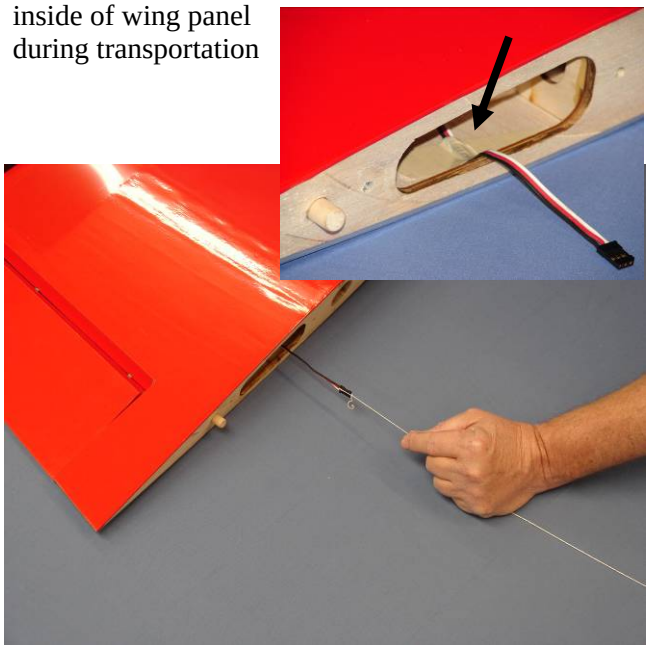
Safety Clips Available from Aeroworks

4. Fasten the pull string from the servo hole to the male plug of the servo extension.

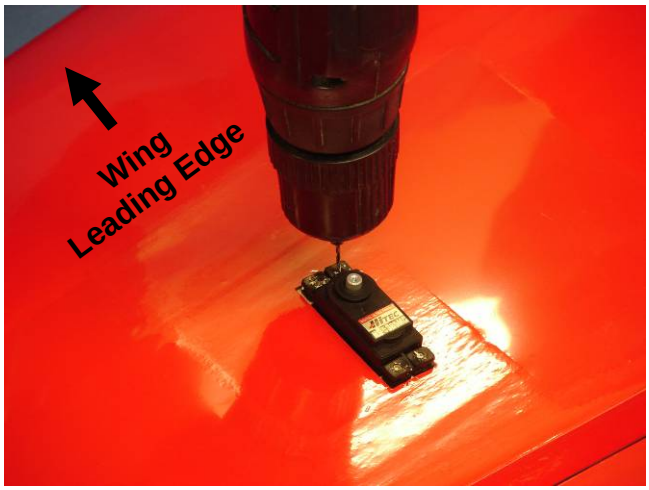


5. Draw the servo extension through the wing and pull through the wing root rib.

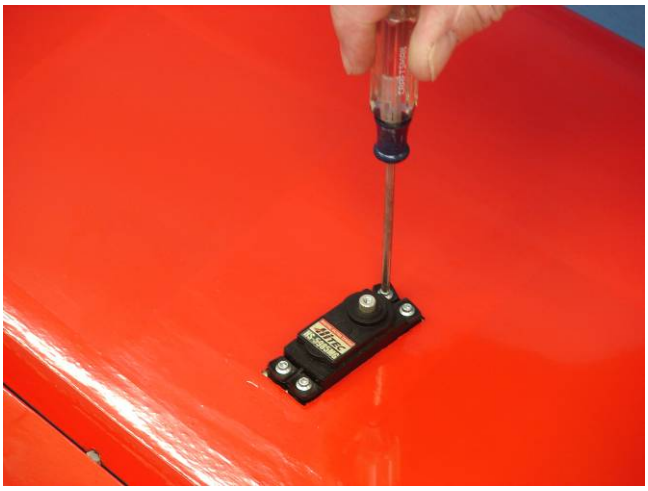
Note: Taping servo lead to the inside of the wing panel will help to prevent lead from dropping back inside of wing panel during transportation



6. Install servo in servo well with the output arm toward the leading edge of the wing. Mark and drill location of servo mounting holes.

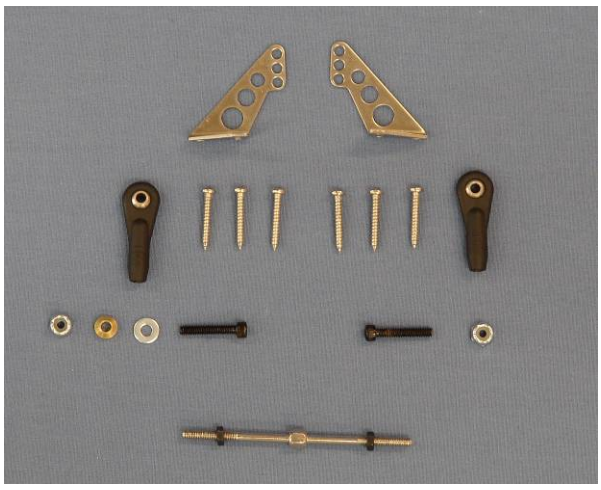


7. Install servo with servo mounting screws.

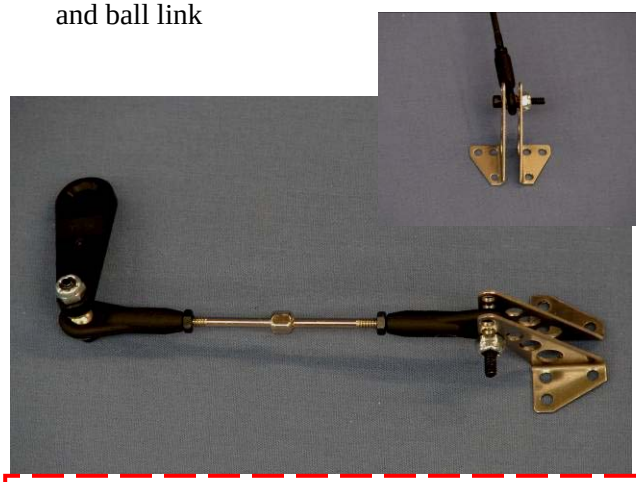


Pushrod / Control Horn Installation

1. Gather the aileron control linkage parts as shown below. 1 pushrod, 2 4-40 ball link assemblies, 1 brass spacer, 1 flat washer, 1 left and 1 right side control horn, and 6 2.6 x 16mm wood screws for each wing panel.



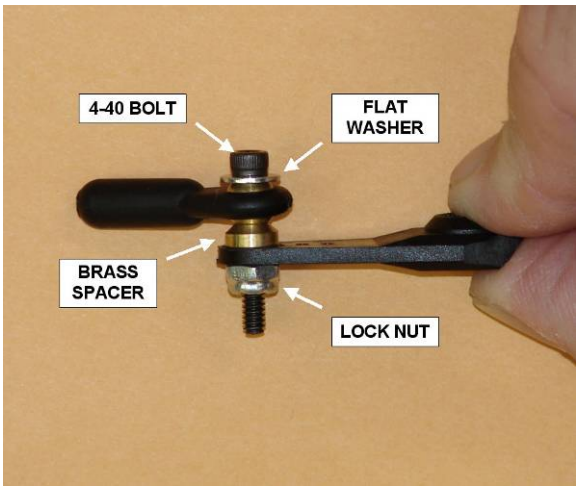
2. Assemble the pushrod and control horn assembly as shown. The ball link goes between the left and right sides of the control horn sides and is secured with a nylon lock nut. Start with the center hole in the control horn. The ball link may be moved up or down for more or less control throw. Brass spacer goes between servo arm and ball link



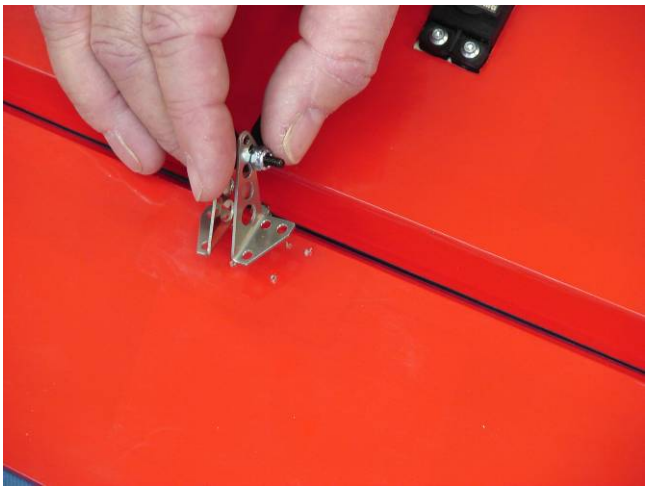
Pushrods have both left and right hand threads. This allows for easier fine adjustments during final setup. Be sure to thread ball link correctly onto pushrod. Ball links are self taping and can be used on either ends of the pushrod. Once ball link has been threaded only rethread it onto the same direction threads.

3. Correct installation of ball link to servo arm shown below.

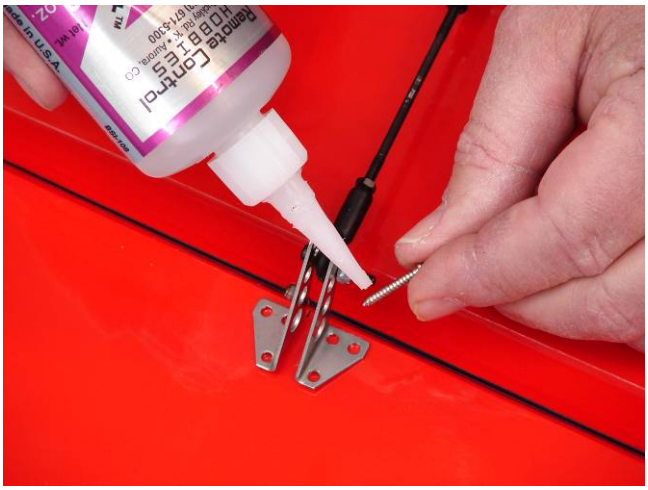
Note: Flat washer will prevent ball link from coming loose from brass ball.



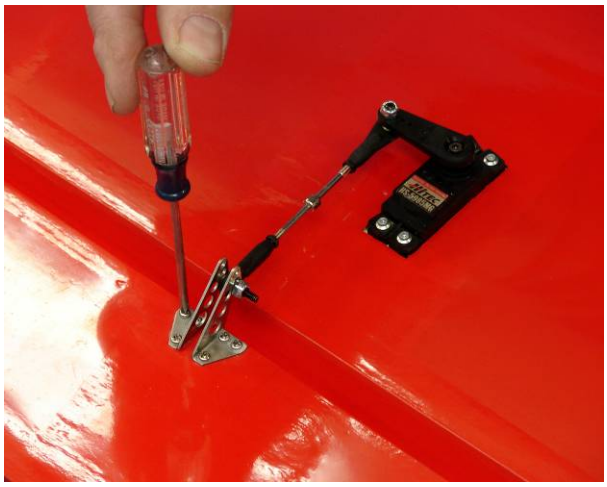
4. Place the control horns over the predrilled mounting holes.



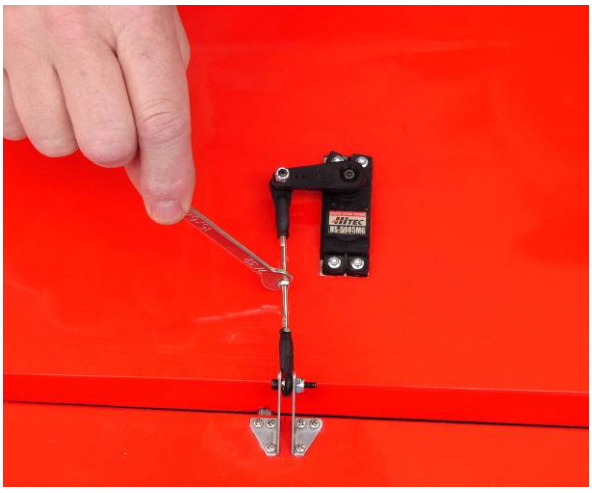
5. Use a drop of thick CA glue on each screw to prevent screws from loosening due to vibration as shown.



6. Securely fasten the control horn to the aileron with six wood screws.



7. Plug the servo into the receiver and turn radio on. Ensure the servo trim and sub trim is centered. Adjust the length of the pushrod so that the servo arm is parallel to the aileron hinge line and the trailing edge of the aileron is even with the trailing edge of the wing in the neutral position.



8. Screw servo arm on the servo output shaft.

Note: On metal geared servos use Blue Loctite for all Servo Arm mounting screws.

9. Ensure the servo does not bind at either end point at full deflection. A 1” servo arm is recommended for best results. A 1 1/4” servo arm is required for full deflection of the aileron bevel.

10. Repeat all the above steps for the other wing.

STAB AND ELEVATOR ASSEMBLY

Elevator Servo Installation

1. The elevators have been pre-hinged and glued to the stabs and are ready for flight. No other steps are necessary for hinging.

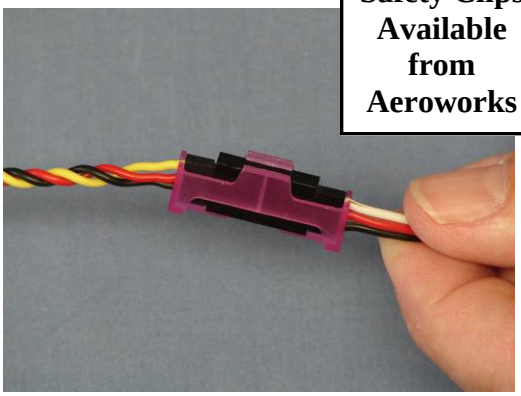
Note: Use clear covering for sealing the hinge gaps. This is an optional step but is recommended

Gather the stab and elevator, elevator servos, mounting screws, 1 1/4" Servo arms, 24" servo extensions and safety clips as shown below.

2. Attach the 24" extension to the servo lead and secure with safety clip, wire, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.

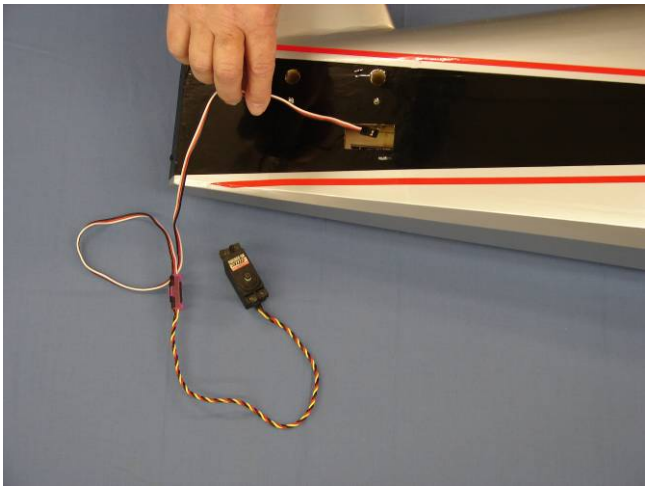
Note: 180 in. oz. digital, metal geared servos are recommended. Servo selection can be the difference between a great flying model and a model that will crash. Always use brand name high quality servos.

Safety Clips Available from Aeroworks

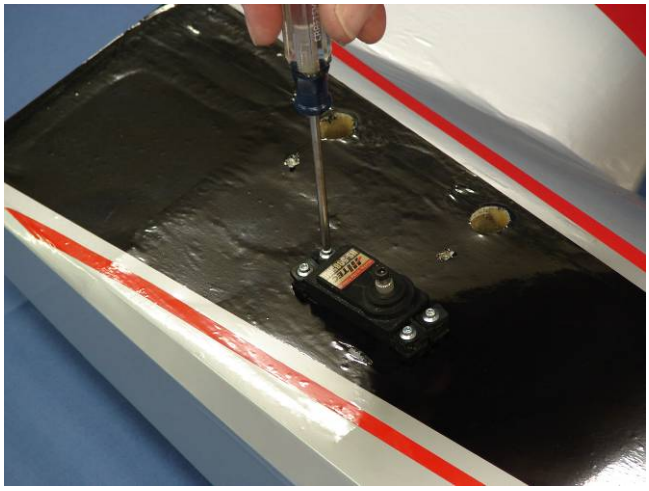


3. Layout the servo on the fuse to test fit the installation and ensure servo lead is the correct length.

4. Feed servo extension through the elevator servo mounting hole in fuse.

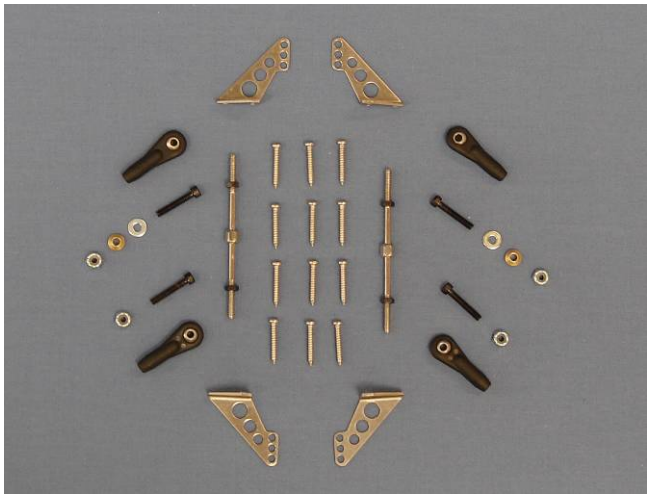


5. Place servo into mounting hole in fuse with servo output shaft facing toward the front as shown. Mark and drill location of servo mounting holes. Install servo with servo mounting screws.

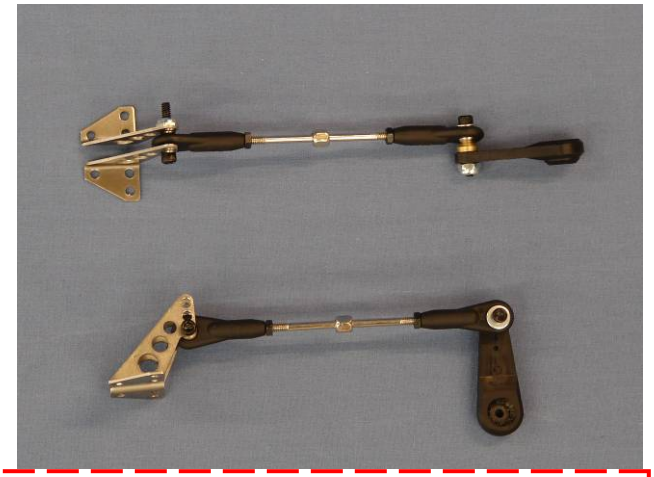


Pushrod / Control Horn Installation

1. Gather the elevator control linkage parts as shown below. 2 pushrods, 4 ball link assemblies, 2 brass spacer, 2 flat washer, 2 left and 2 right side control horns, and 12 2.6 x 16mm wood screws.



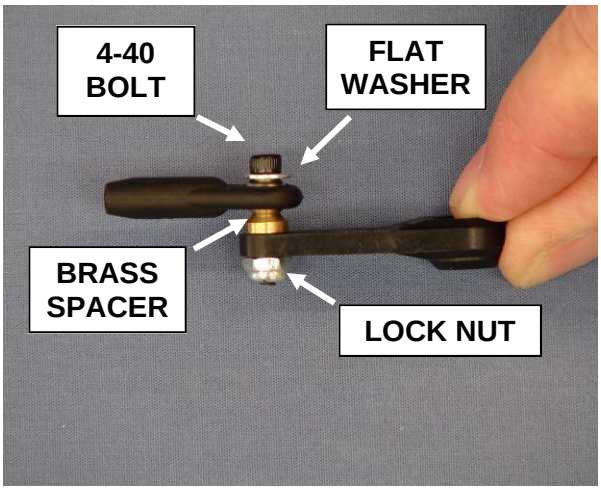
2. Assemble the pushrod and control horn assembly as shown. The ball link goes between the left and right sides of the control horn sides and is secured with a nylon lock nut. Start with the center hole in the control horn. The ball link may be moved up or down for more or less control throw. Brass spacer goes between servo arm and ball link



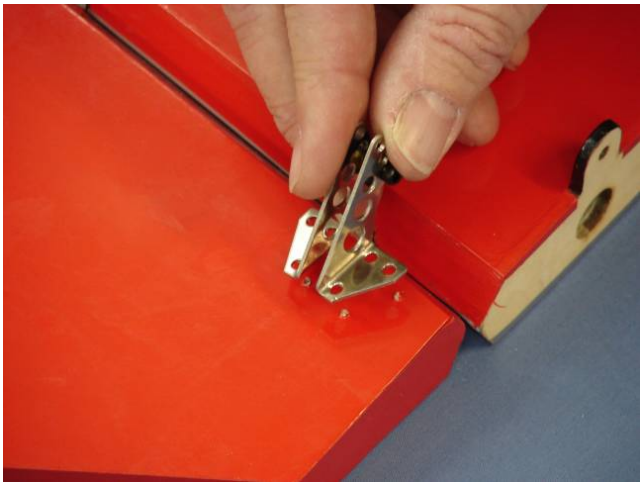
Pushrods have both left and right hand threads. This allows for easier fine adjustments during final setup. Be sure to thread ball link correctly onto pushrod. Ball links are self taping and can be used on either ends of the pushrod. Once ball link has been threaded only rethread it onto the same direction threads.

3. Correct installation of ball link to servo arm shown below.

Note: Flat washer will prevent ball link from coming loose from brass ball.



4. Place the control horns over the predrilled mounting holes.

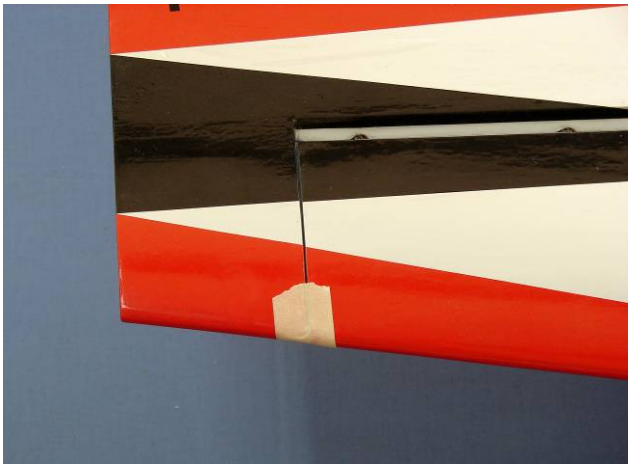


5. Use a drop of thick CA glue on each screw to prevent screws from loosening due to vibration as shown.

6. Mount the control horn using six wood screws.

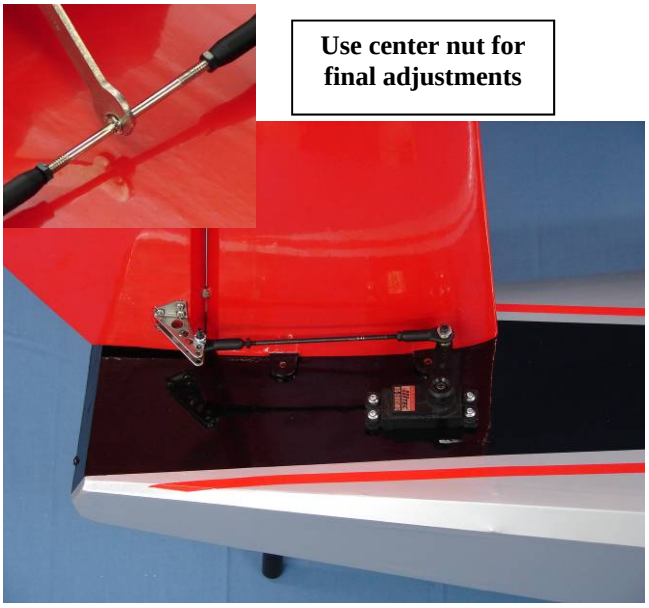
7. Correct installation of elevator servo linkage to elevator control horn shown below.

8. Tape leading edge of the elevator balance tab to the leading edge of the stab in the neutral position. Plug the elevator servo into the receiver and turn radio on. Ensure the servo trim and sub trim are in the center position.



9. Attach the stab and elevator to the fuse and bolt in place. Using center nut adjust the length of the elevator pushrod so that the servo arm is 90 degrees to the servo case when it is placed on the servo output shaft. Ensure the servo does not bind at either end point at full deflection.

10. Repeat the above steps for the other stab and elevator.



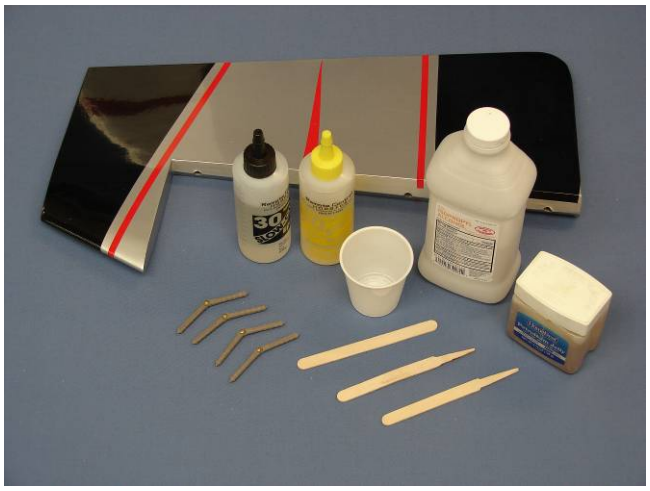
Use center nut for final adjustments

11. Finished elevator servo installation shown below.

RUDDER AND PULL – PULL CABLE ASSEMBLY

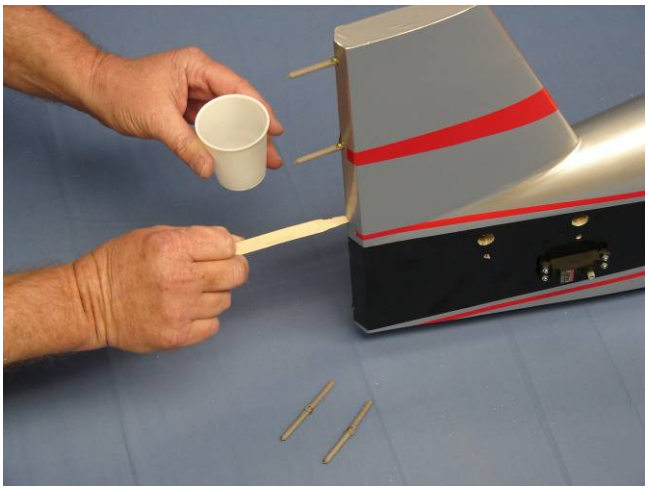
Rudder Installation

1. Gather the rudder, four hinges, rubbing alcohol, petroleum jelly and epoxy materials as shown. Use 15-30 minute epoxy to ensure adequate working and cleanup time.

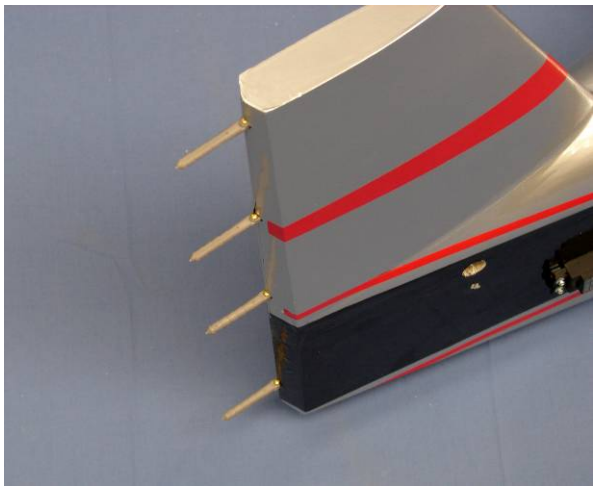


2. Prep all hinges for installation by applying Vaseline petroleum jelly or light oil to the hinge joint. This ensures no epoxy gets into the hinge during assembly.

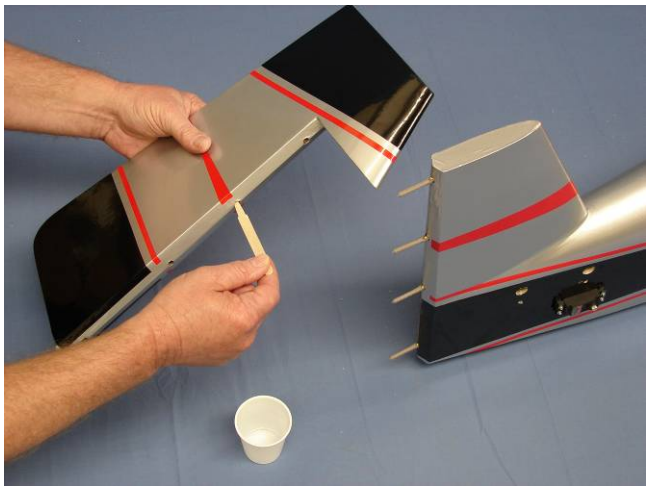
3. Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the trailing edge of the fin. Apply epoxy to one side of each hinge and insert the hinge completely into the hole. Ensure the hinge axis is vertical and parallel to the trailing edge of the fin before epoxy cures. Wipe away excess epoxy with alcohol wetted wipes.



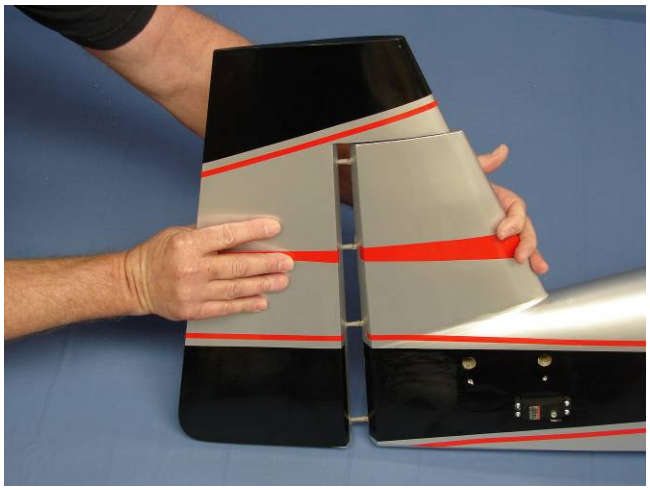
4. Epoxy the hinges into the fin first and allow epoxy to fully cure.



5. Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the leading edge of the rudder. Apply epoxy to trailing edge of each hinge.



6. Carefully slide the rudder onto each hinge and against the trailing edge of the fin. Wipe away excess epoxy with alcohol wetted wipes.

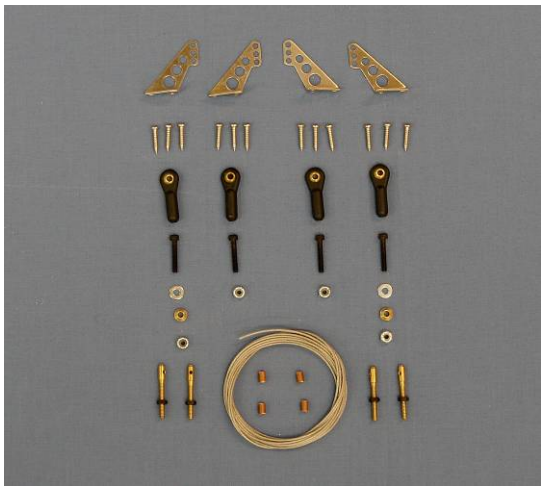


7. Ensure there is no gap between fin and rudder. Allow epoxy to fully cure. Check you have full rudder deflection before epoxy fully cures.

Note: Use clear covering for sealing the hinge gaps. This is an optional step but is recommended

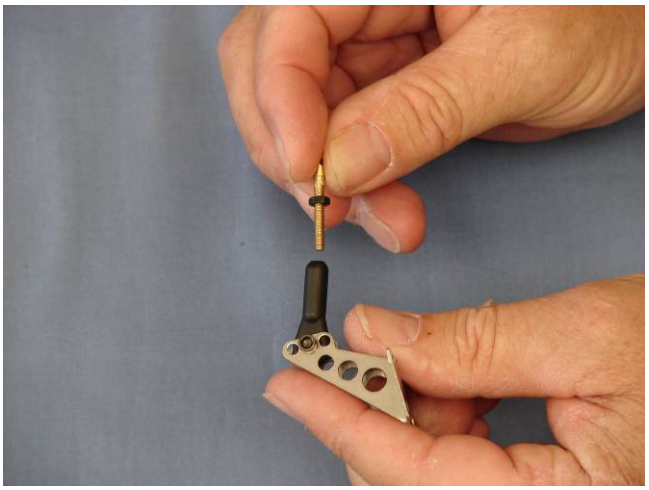
Rudder Horn, Pull-Pull Cable and Servo Installation

1. Gather the rudder control linkage parts shown below. 2 rudder cables, 4 ball link assemblies, 2 flat washers, 4 threaded couplers with lock nut, 4 brass swaging tubes, 2 left and 2 right side control horns, and 12 2.6 x 12mm wood screws.

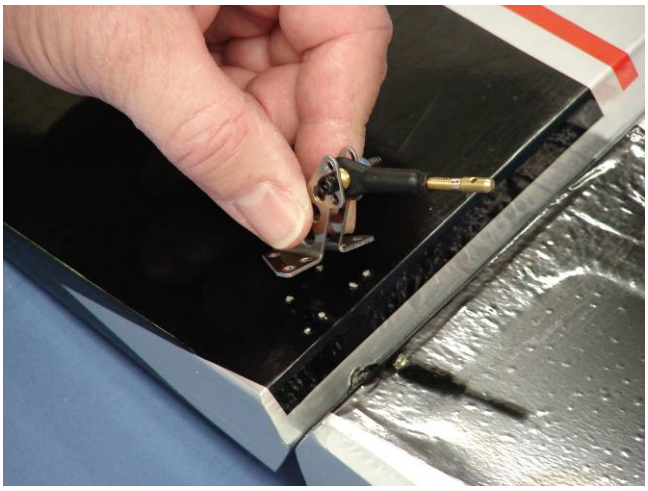


2. Gather the rudder control horn parts as shown below. 2 ball link assemblies, 2 left and 2 right side control horns. Assemble the ball links between the control horns as shown. Secure with nylon lock nut. Start with the center hole in the control horn. The ball link may be moved up or down for more or less control throw.

3. Thread brass coupler half way into ball link.



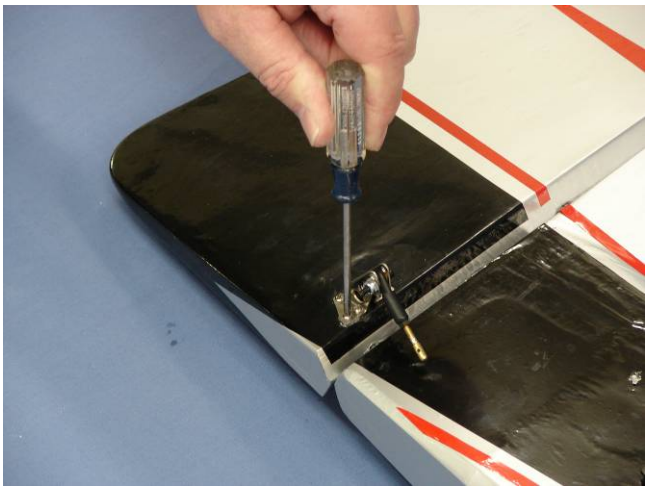
4. Place the control horns over the predrilled mounting holes.



5. Use a drop of thick CA glue on each screw as shown.

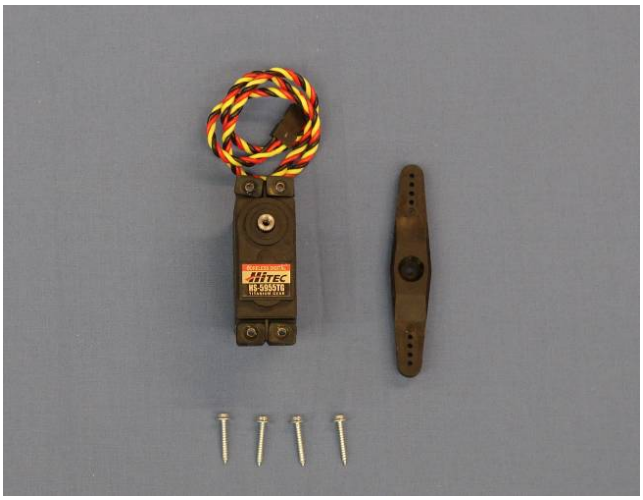
6. Mount rudder control horns using six wood screws.

7. Repeat the above steps for mounting the other side rudder control horn.



8. Gather one rudder servo, mounting screws and 2 3/4” double output arm as shown below.

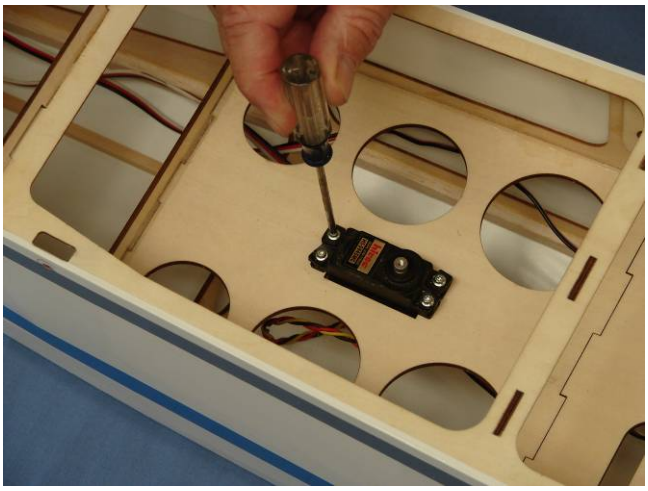
Note: 180 in. oz. digital, metal geared servo is recommended. Servo selection can be the difference between a great flying model and a model that will crash. Always use brand name high quality servos.



9. Install the rudder servo in the servo cutout with the output shaft to the front.

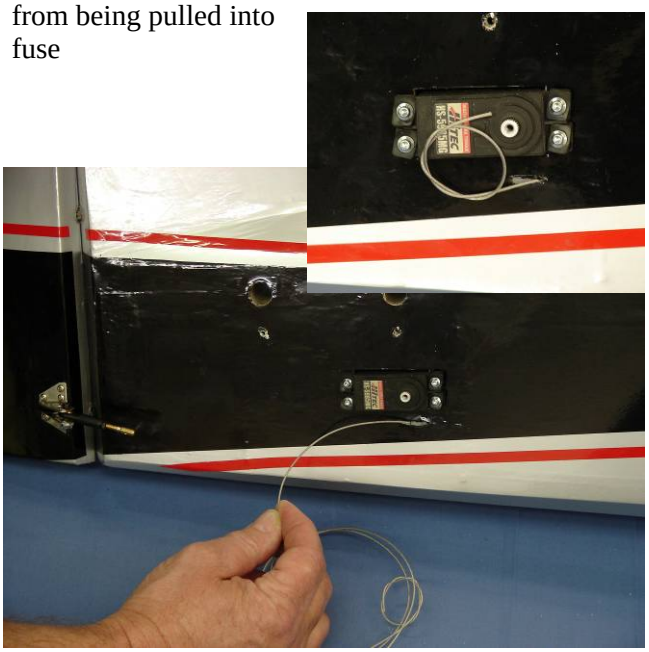
10. Mark and use a 1/16 bit to drill the rudder servo mounting holes.

11. Install rudder servo with servo screws.



12. Feed one rudder cable through the pre installed cable exit tube in the rear of the fuse toward the front of the fuse. Repeat for other side.

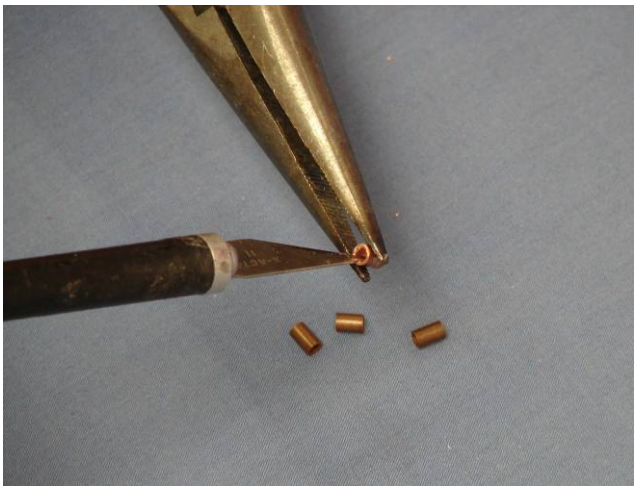
Note: Loop or tape cable to fuse to prevent cable from being pulled into fuse



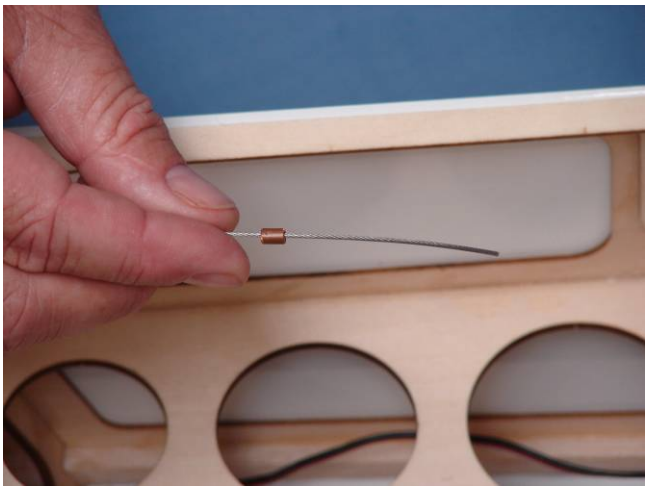
13. Pull the rudder cables from rear of fuse to the rudder servo tray.

Note: Cables run parallel down fuse and do not cross each other.

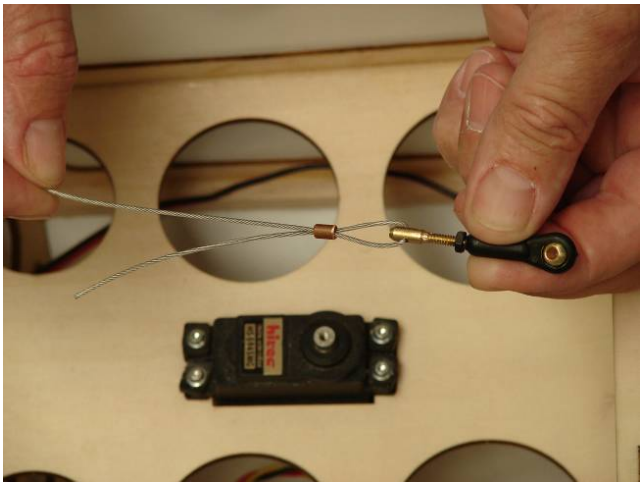
14. Using an X-ACTO knife clean away any burrs from brass swags. This will allow the rudder cable to pass through brass swage easily.



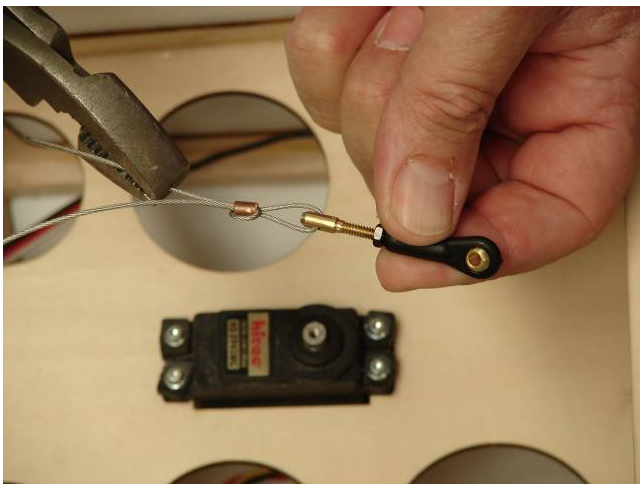
15. Thread cable through brass swage tube.



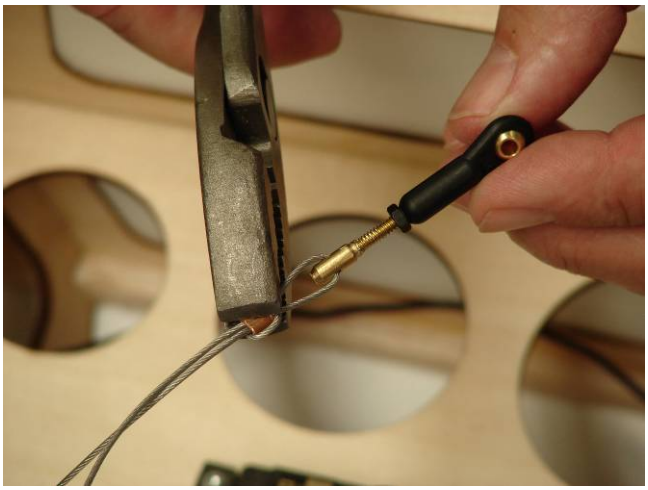
16. Thread cable through the threaded coupler hole, and back through the brass swage tube as shown.



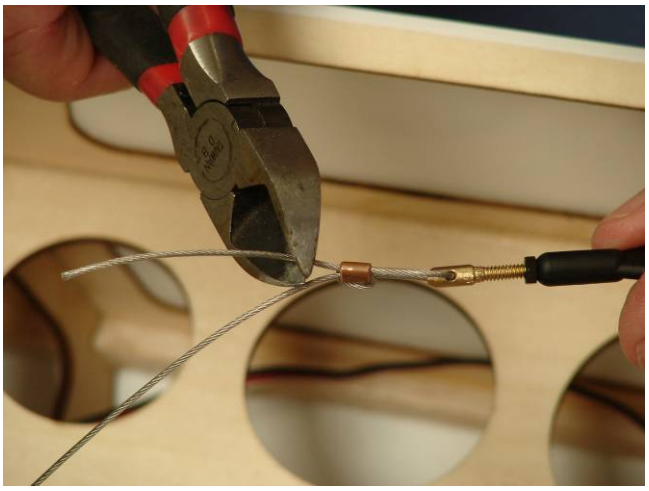
17. Loop the cable back through the brass swage tube and pull tight.



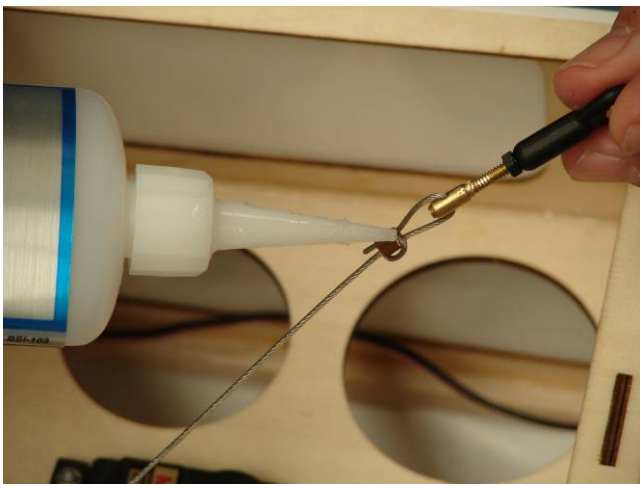
18. Crimp the brass swage tube with a crimping tool or pliers.



19. Cut off excess cable as shown

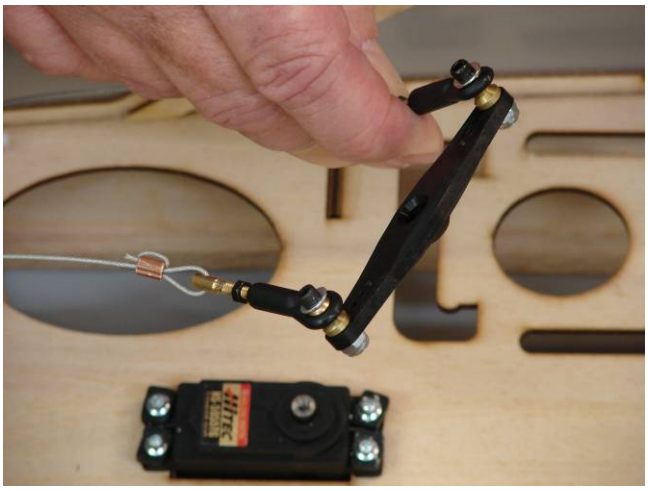


20. A drop of thin CA may be applied to the swage tube to help secure the cable.



21. Attach ball links to the rudder servo arm and then attach the servo arm to the rudder servo as shown.

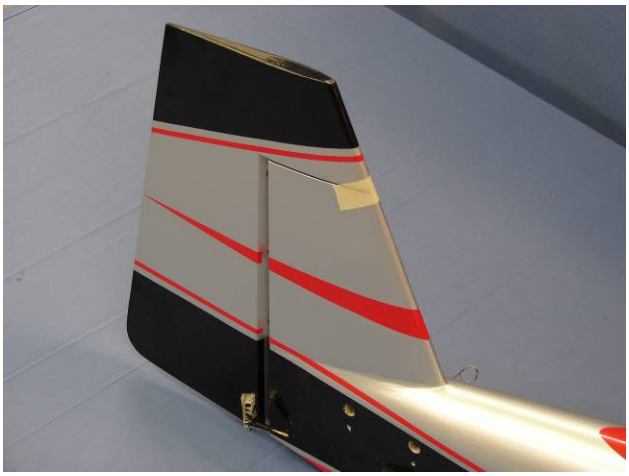
Note: Use flat washers to prevent link from coming loose from the brass ball



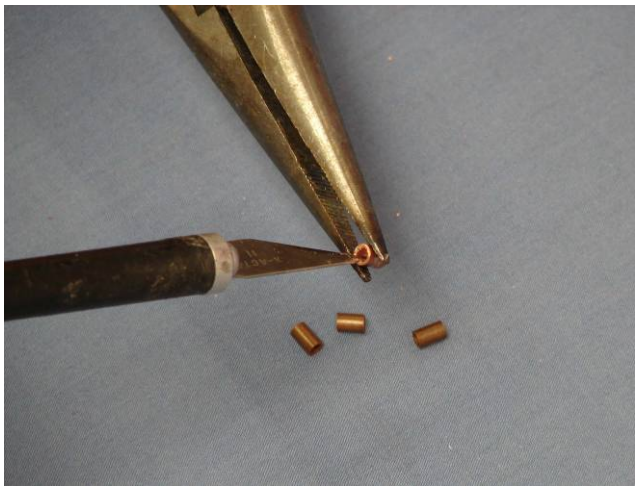
22. Plug the rudder servo into the rudder channel of the receiver and power up. Turn on transmitter to center rudder servo. Ensure servo trim and sub trims are centered.

Note: On metal geared servos use blue Loctite for all Servo arm mounting screws.

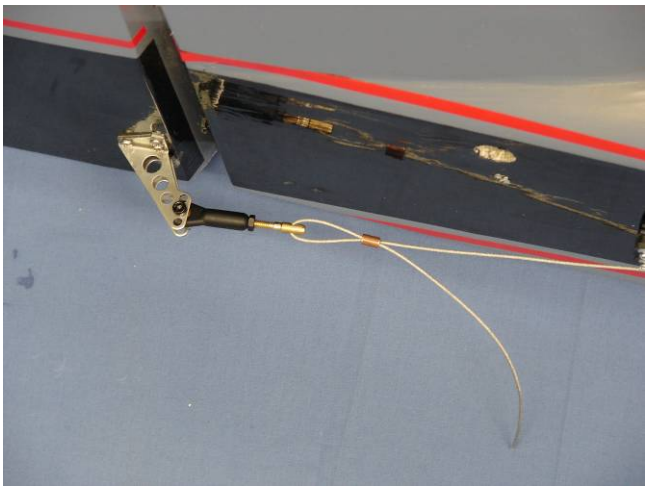
23. Tape the rudder balance tab to the top leading edge of the vertical fin in the neutral position as shown. This ensures the rudder is straight when the cables are attached.



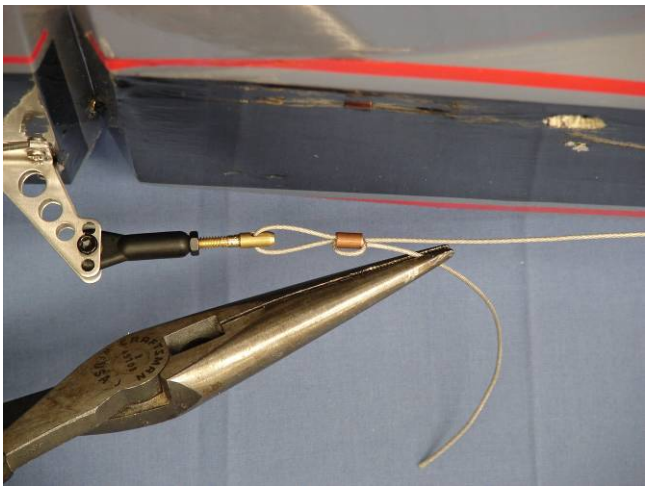
24. Using an X-ACTO knife clean away any burrs from brass swags. This will allow the rudder cable to pass through brass swage easily.



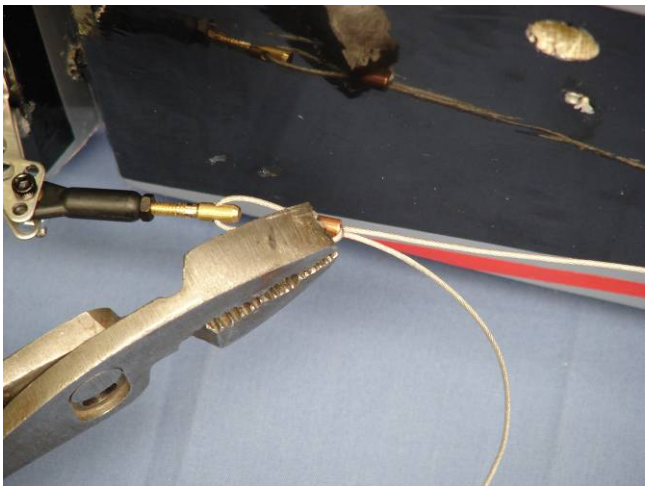
25. Thread the rudder cable through a brass swage tube, then the threaded coupler, and back through the brass swage tube on both sides. Pull light tension on the cable through the coupler on both sides as shown. The loop through the coupler should be approximately 1/2” long.



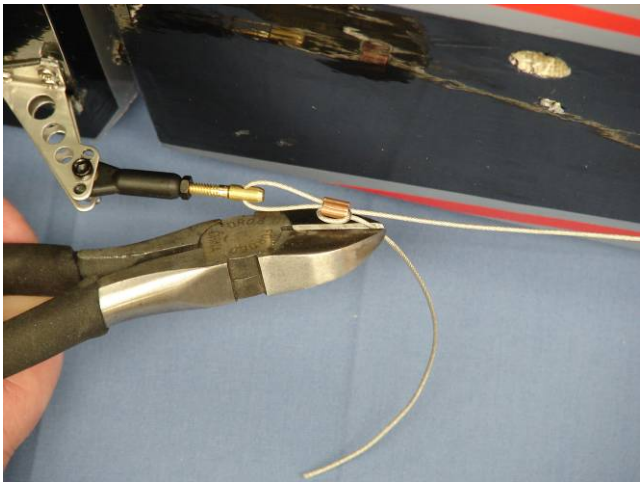
26. Loop the cable back through the brass swage tube and tighten the second loop through the brass swage tube as shown.



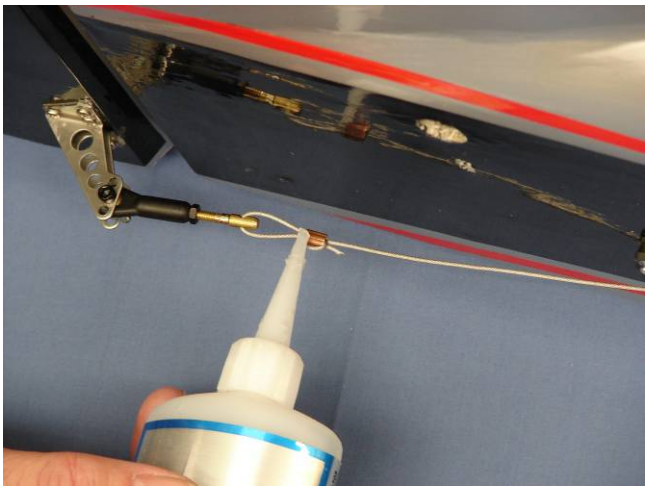
27. Crimp the brass tube with a crimping tool or pliers.



28. Cut off access cable as shown.

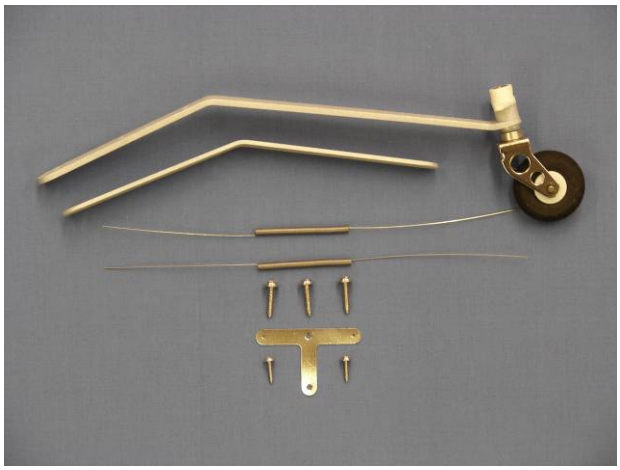


29. A drop of thin CA may be applied to the swage tube to help secure the cable.



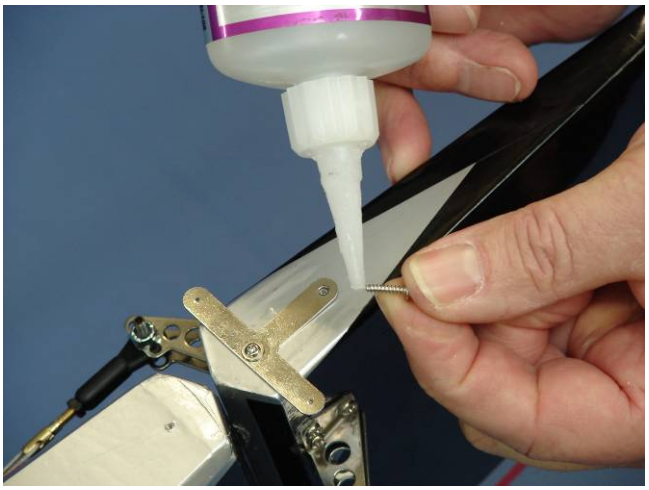
Tail Wheel Installation

1. Gather the tail wheel parts shown below. Tail wheel strut, leaf spring, 3 tail wheel mounting screws, steering tiller, 2 tiller mounting screws, and 2 steering springs.



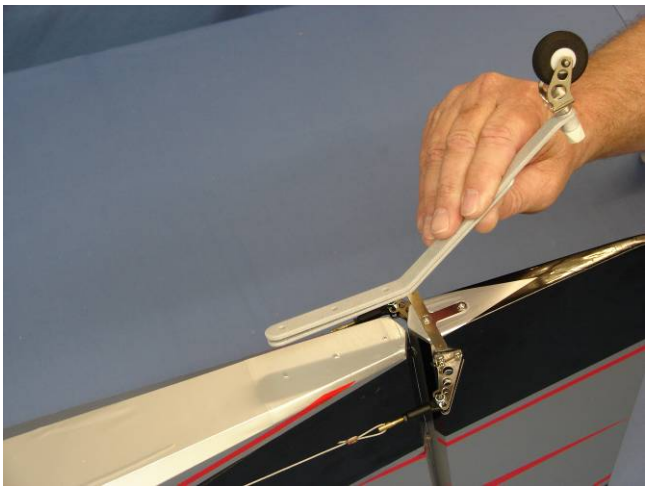
2. Align rudder tiller steering arm with pre drilled mounting holes at bottom of rudder.

3. Apply a drop of thick CA to the tiller arm mounting screws before inserting in the pre-drilled holes.



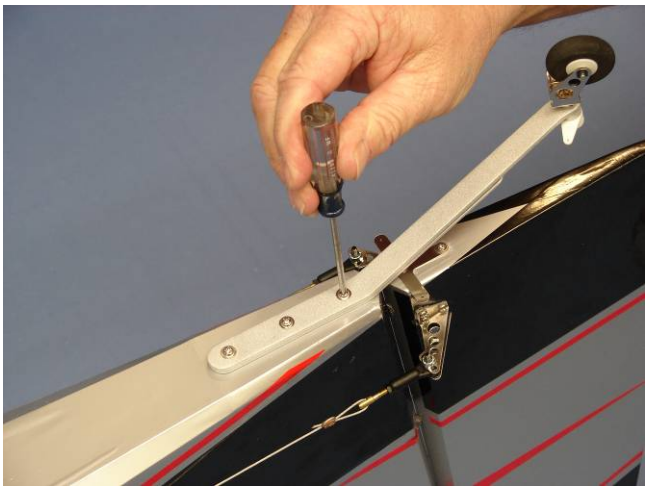
4. Mount the tail wheel steering tiller using two wood screws.

5. Place the tail wheel leaf spring on top of the tail wheel strut. Align the tail wheel with pre drilled mounting holes on the bottom of the fuse

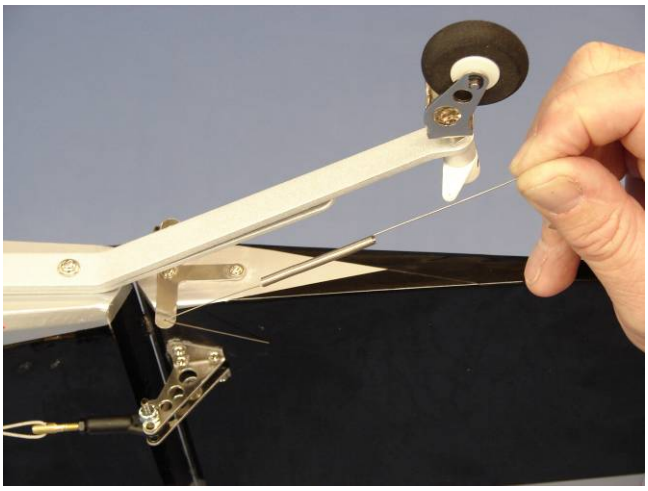


6. Place a drop of thick CA on tail wheel strut mounting screws before inserting in the pre-drilled mounting holes on the bottom rear of the fuse.

7. Mount the tail wheel struts using three wood screws.

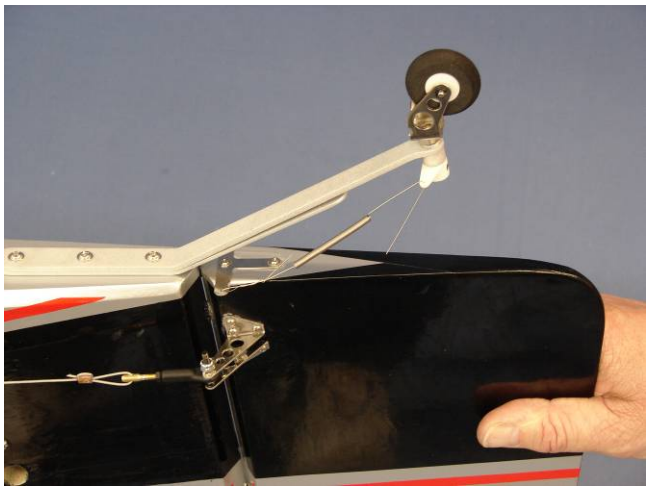


8. Attach the steering spring to the rudder tiller. Center the spring between both tail wheel and steering tillers.

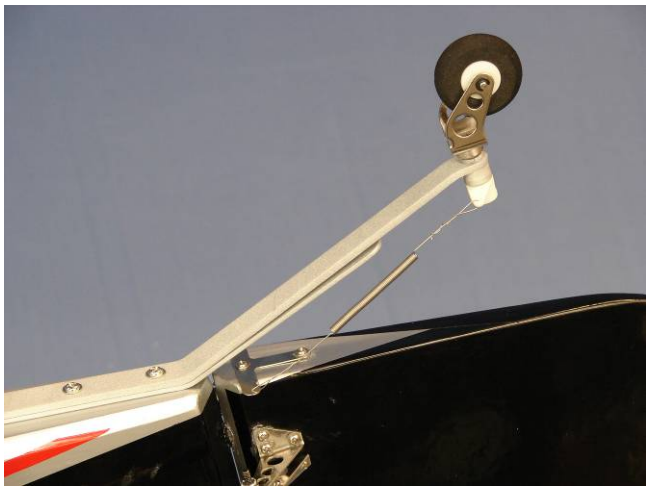


9. Use pliers to twist spring end closed around the rudder steering tiller.

10. With spring centered between tiller arms and tail wheel centered, bend spring wire through tail wheel steering tiller. Twist spring end tight with pliers.

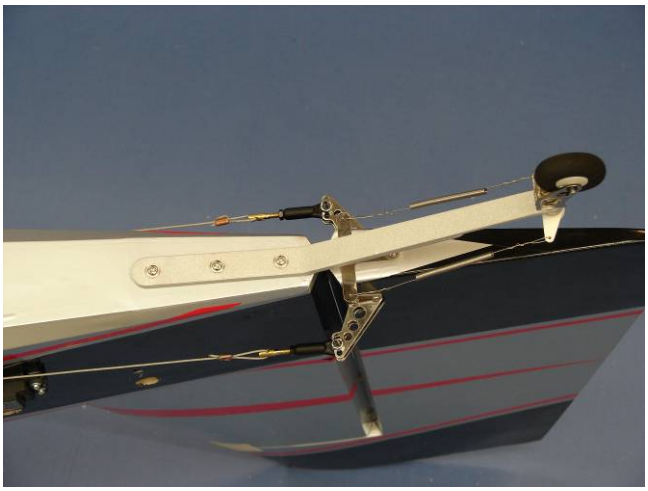


11. Repeat spring installation for other side.



12. Tail wheel final assembly is complete.

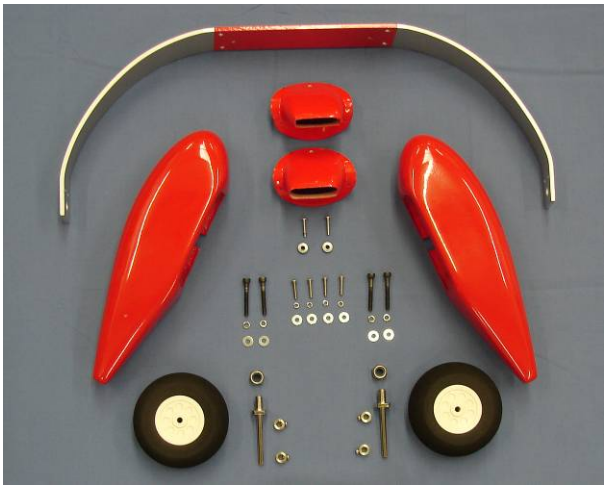
13. Bottom view of completed tail wheel installation.



MAIN LANDING GEAR - GEAR CUFF AND WHEEL PANT ASSEMBLY

Main Landing Gear Installation

1. Gather the landing gear parts as shown below. Landing gear strut, 4 8-32 mounting bolts, 4 flat washers, 4 lock washers, 2 gear cuffs, 2 4-40 mounting bolts, 2 #6 bonded washers, 2 wheels, 2 axles assemblies, and 4 wheel collars as shown below.

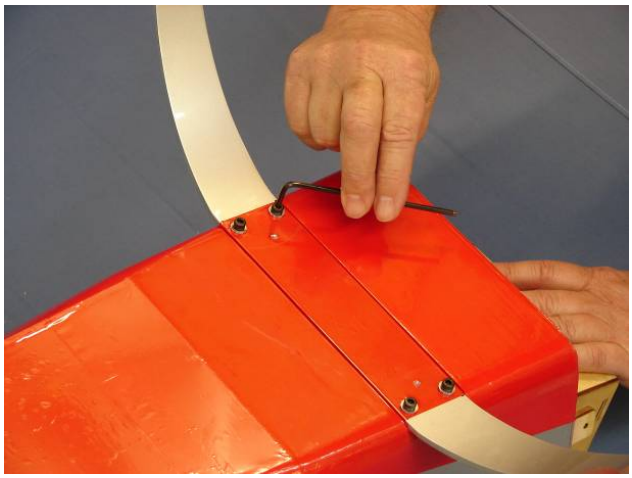


2. Align mounting holes of main landing gear with pre drilled mounting holes in fuselage mounting plate.

Note: Mounting holes have been offset to ensure proper installation of main gear.

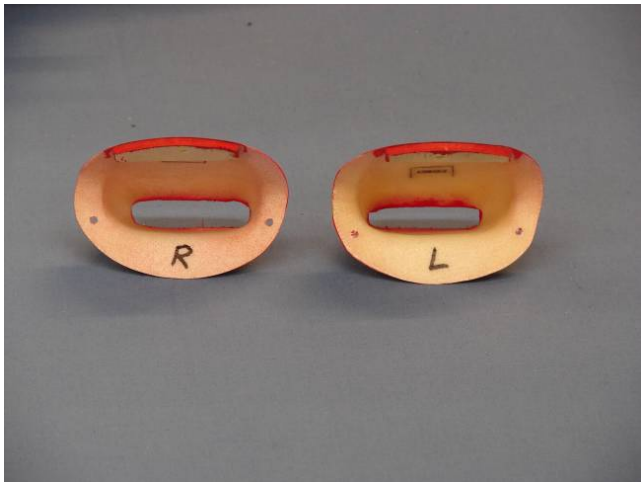
3. Assemble the 8-32 landing gear bolts with lock washer then flat washer. Use a drop of blue Loctite on landing gear bolts before attaching the landing gear.

4. Bolt landing gear strut to fuse with (4) bolts and washers.

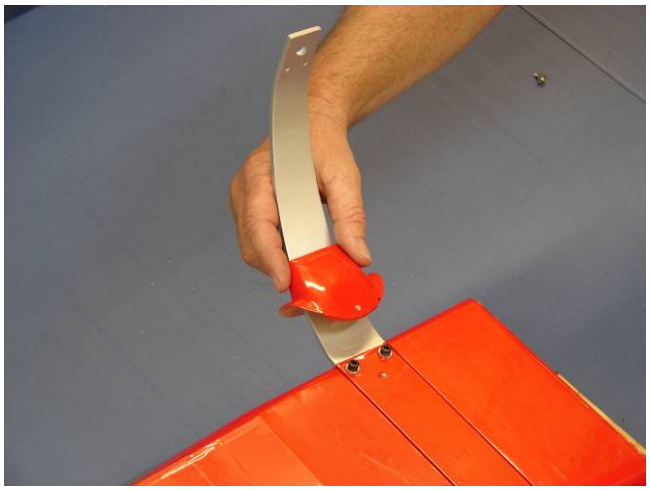


5. Gather the landing gear cuffs, mounting bolts and bonded washers.

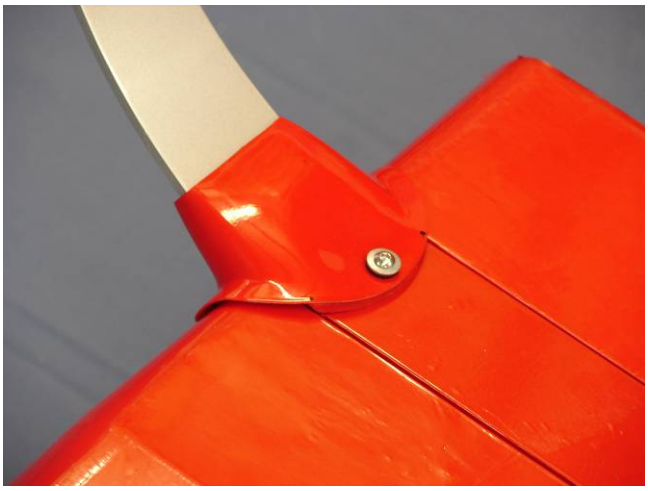
Note: There is a right and left gear cuff.



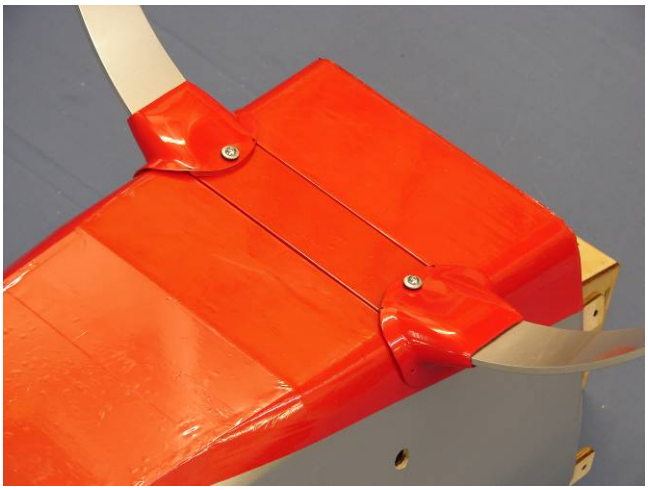
6. Slide the gear cuff onto the proper gear strut.



7. Install gear cuff using 4-40 bolt and bonded washer.



8. Repeat process for opposite side gear cuff.

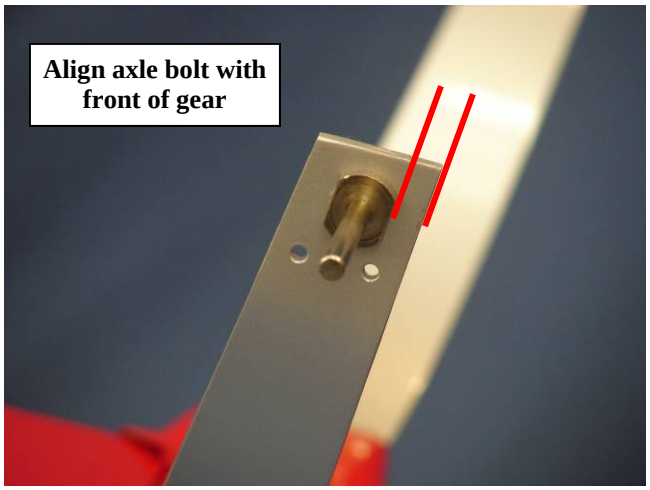


9. Using lock nut install axle to gear.

Note: Do not tighten securely yet.

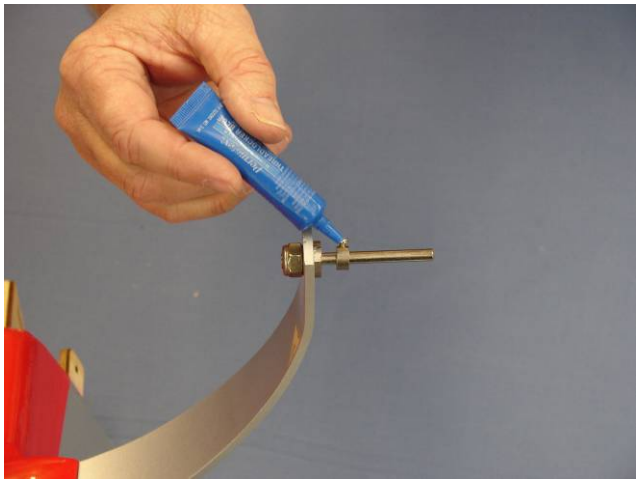
10. Align the flat sides of the axle bolt vertical and snug the lock nut against the landing gear strut.

Note: Do not tighten securely yet.

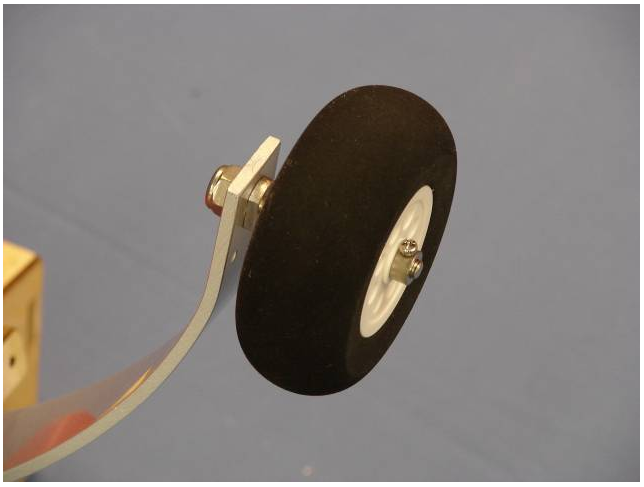


11. Align the wheel pant slot over the axle bolt as shown. Slide the wheel pant slot over the flat sides of the axle bolt and align blind nuts in wheel pants with mounting holes in landing gear. When all bolt holes are aligned tighten axle in place.

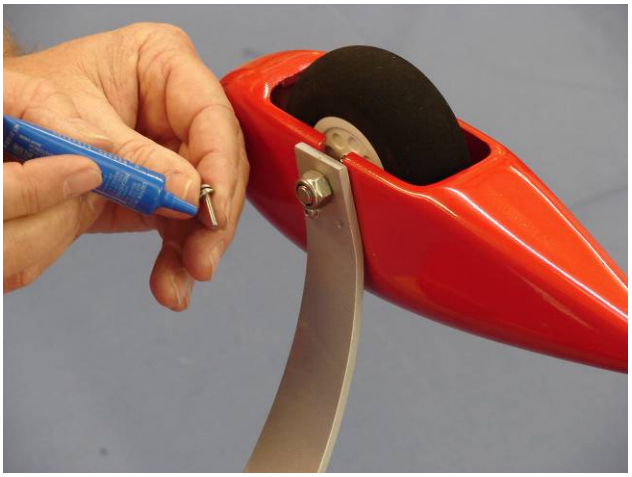
12. Install the inner wheel collar on the axle. Use a drop of blue Loctite on the wheel collar set screw and tighten the wheel collar in place.



13. Install the wheel and outer wheel collar. Use blue Loctite on the wheel collar set screw before final tightening.

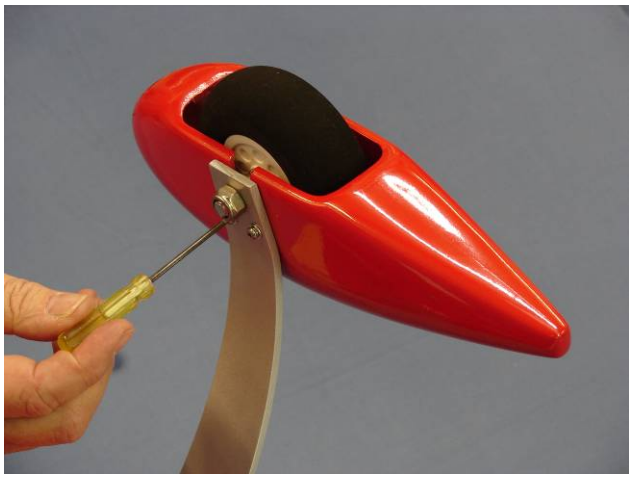


14. Slide the lock washer then the flat washer on the wheel pant mounting bolts. Use blue Loctite on the bolts before final tightening.



15. Final installation of wheel pant with two mounting bolts.

Note: Make sure wheel turns freely without binding or rubbing against the wheel pant. Adjust wheel collars in or out until wheel turns freely.

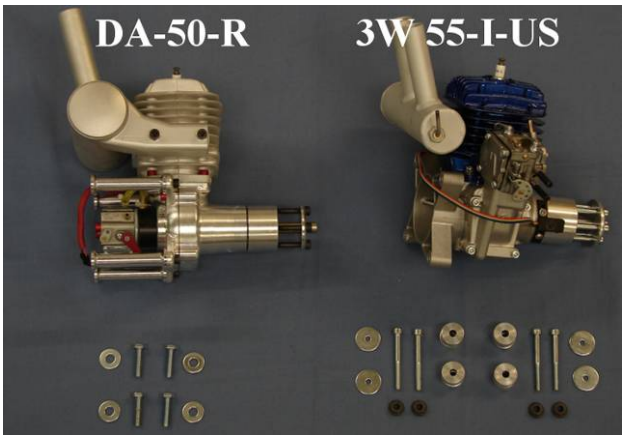


16. Repeat above steps for other wheel and wheel pant.

ENGINE AND THROTTLE SERVO INSTALLATION

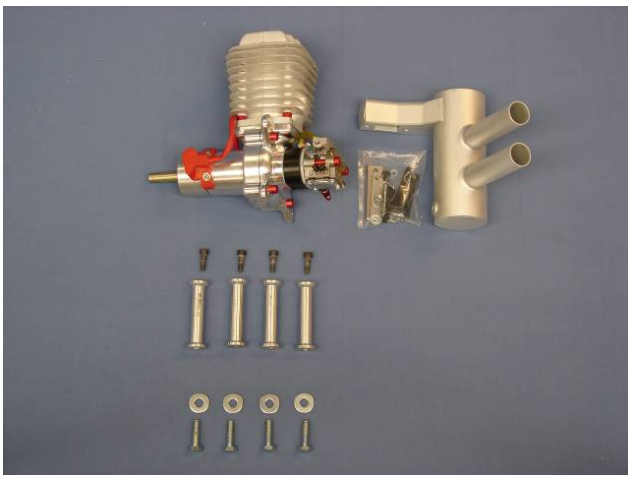
Engine Installation

1. The 50cc Extra 300LP will accept a wide range of engine types. The DA-50 rear carburetor engine with Pitts style muffler, was mounted and used for the test flights.

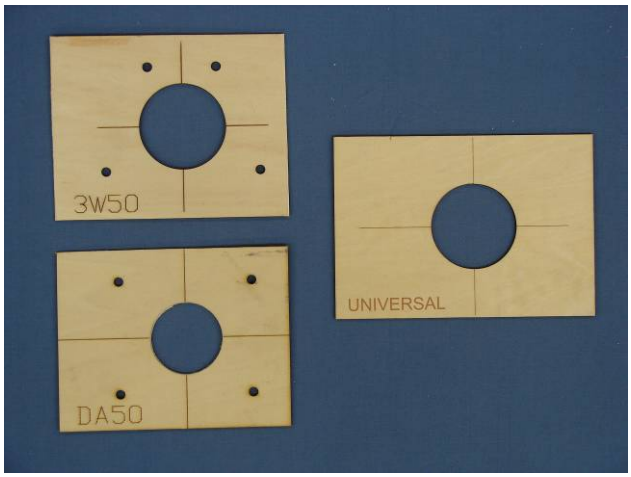


2. DA 50 with 2 1/2" Stand offs, Pitts style muffler and mounting hardware shown below.

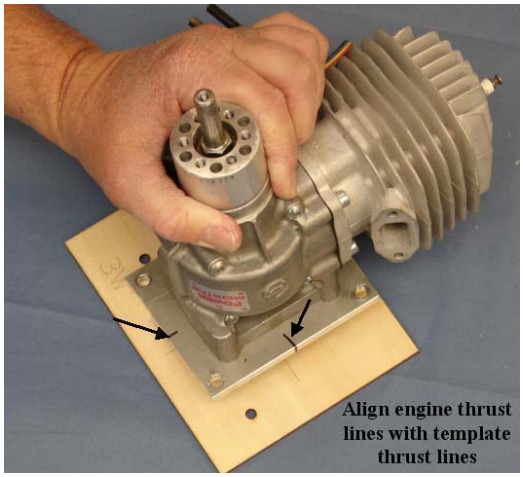
Note: Mounting hardware is **Not Supplied**. 2 1/2" stand offs available through Desert Aircraft.



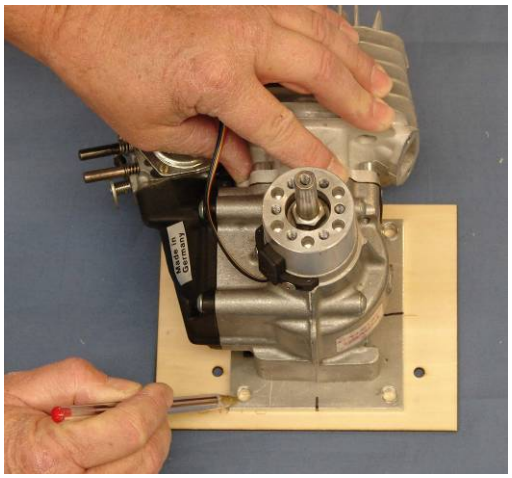
3. Locate the laser cut engine mounting template for either the DA-50 or 3W-50. If other engines are used the Universal template may be modified for any mounting pattern



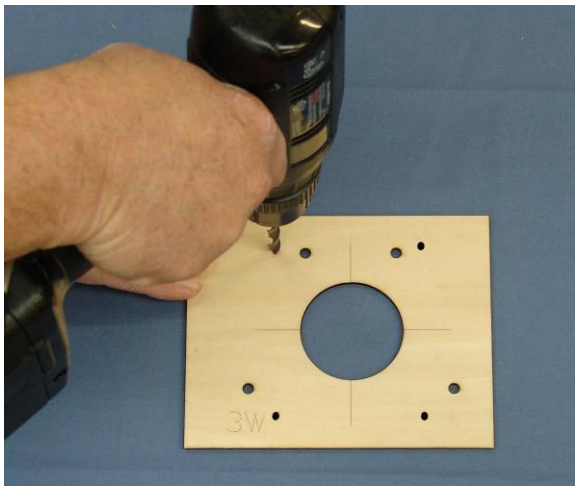
4. To modify the universal mounting template to accommodate your engine of choice. Line up the laser etched thrust lines on the template with the engine thrust lines.



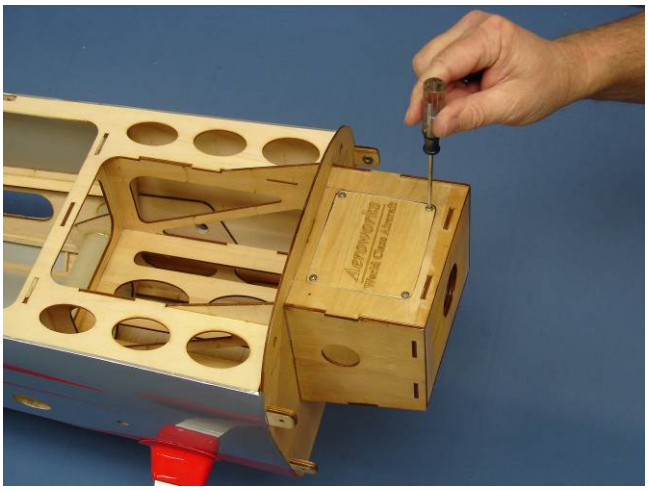
5. Mark the location of the engine mounting holes on template.



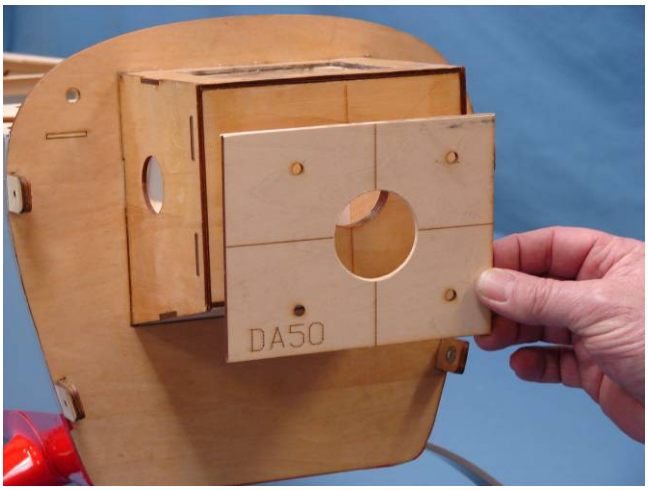
6. Use a 1/4 drill bit to drill the engine mounting holes. Template is now ready for use.



7. Remove engine box top hatch cover.

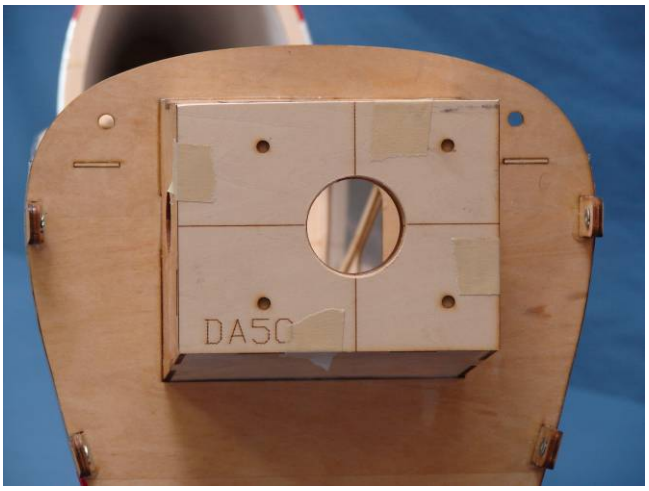


8. Align mounting template to front of firewall.

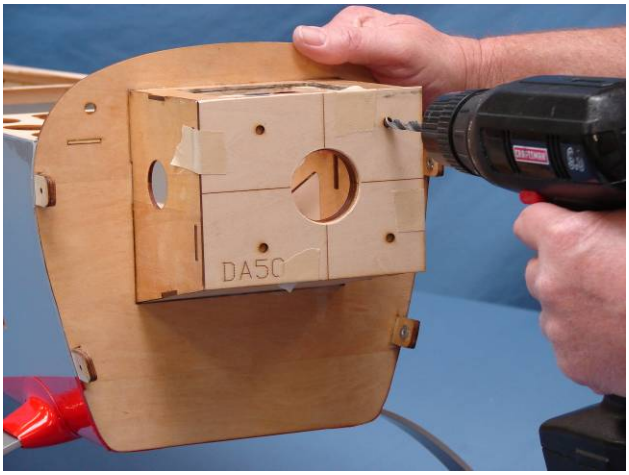


9. Align mounting template with firewall and tape in place.

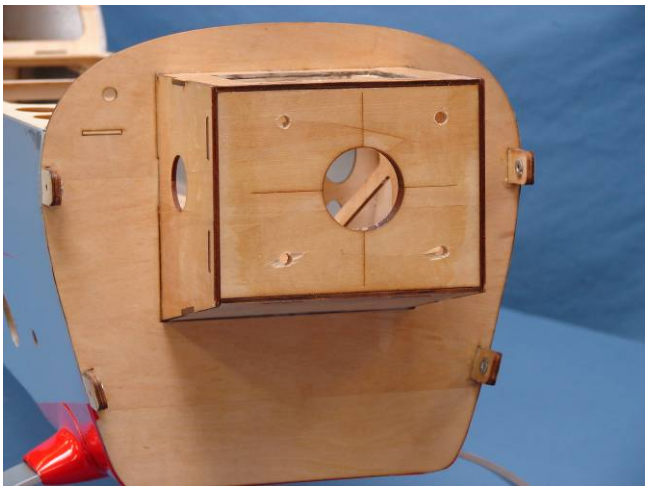
Note: Use following steps for all types of engine installations.



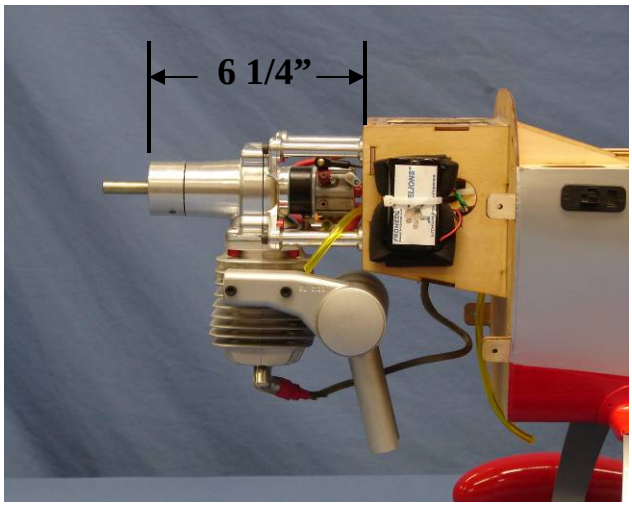
10. Use a 1/4 bit to drill the engine mounting holes in firewall.



11. Remove mounting template from firewall. Firewall shown with mounting holes drilled ready for engine mounting.



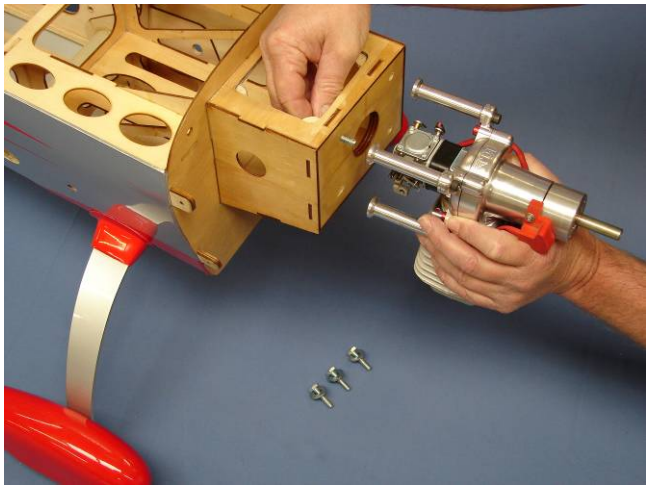
12. Distance from front of firewall to front of engine prop hub is **6 1/4”**.



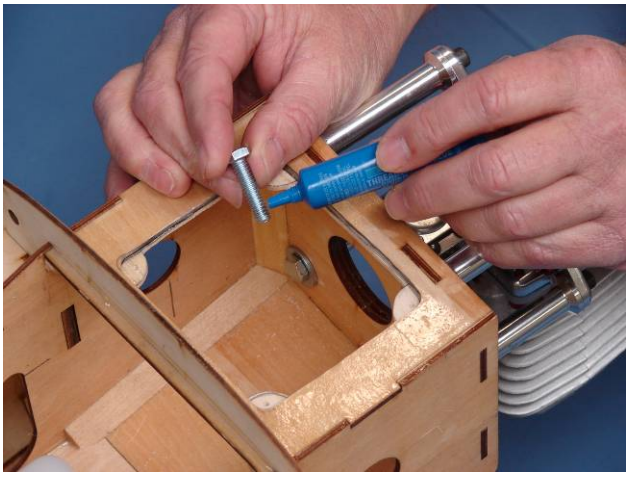
13. Using mounting bolts and Fender washers mount engine to firewall.

Note: Using a flat fender washer behind firewall will help distribute the bolt pressure and help prevent the wood from crushing. Washers are **Not Supplied!**

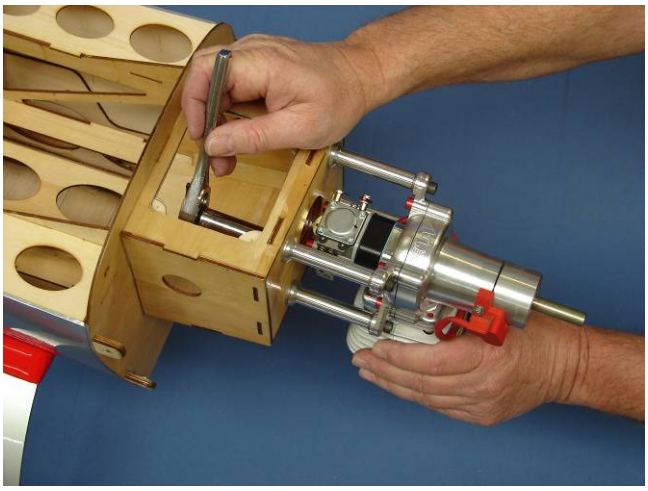
Note: Before installing engine refer to cowl mounting instructions **Page#58 Step #3** for making center line reference marks on bottom of cowl and fuselage. Performing this step prior to mounting the engine will allow you to mount the cowl to the fuse to make necessary alignment marks.



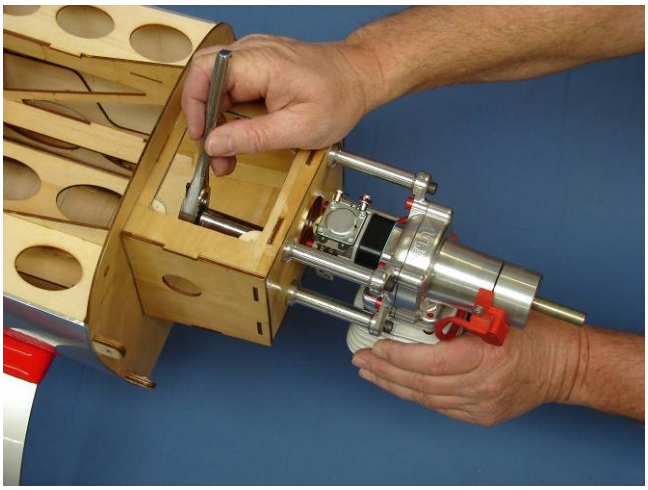
14. Use blue Loctite to secure all mounting hardware.



15. Tighten mounting bolts and secure engine to firewall.



16. Securely tighten the engine to the firewall as shown. We recommend using 1/4-20 bolts and lock nuts for engine mounting. You may also use blind nuts behind the firewall for engine mounting if preferred.

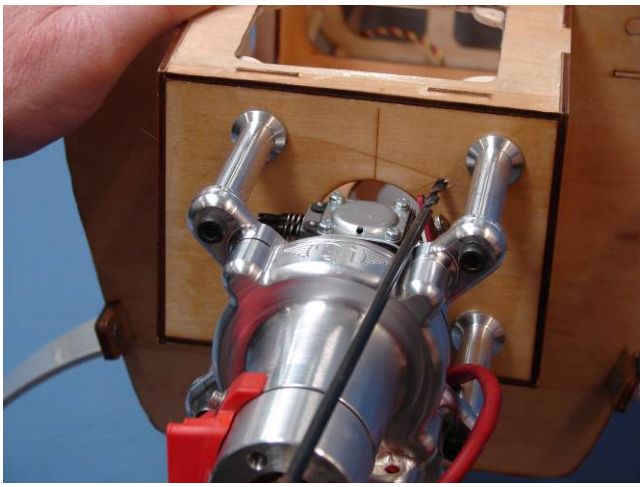


Throttle Servo and Choke Installation

1. Gather the left and right plywood throttle and choke servo mounting trays, the throttle and choke servos, servo arms and pushrod parts as shown below.

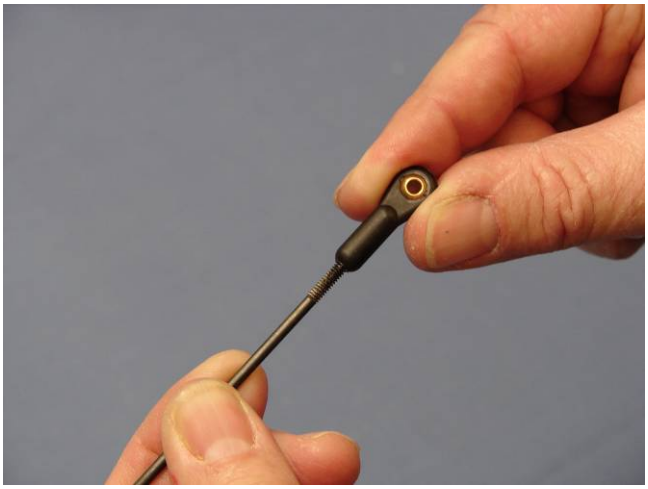
   2 x 4-40 metal rods threaded at one end
   4 x 4-40 ball links and hardware
   4 x brass spacers
   2 x 4-40 threaded solder couplers
   2 x 4-40 threaded quick links

2. Use a 1/4” bit to drill a pushrod exit hole in the firewall in line with the engine carburetor throttle arm.

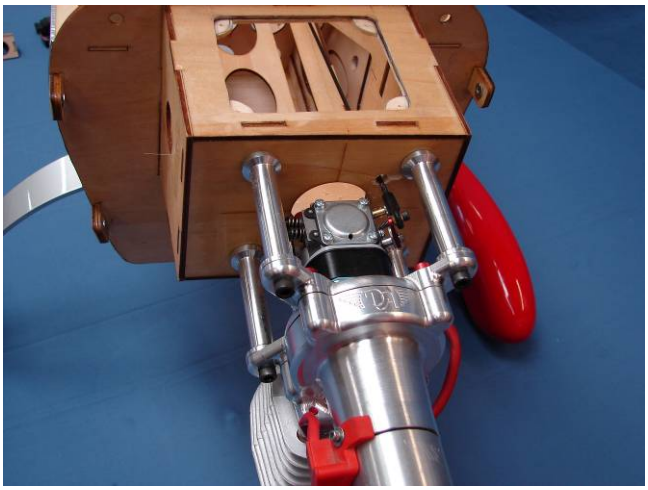


3. Assemble ball link to threaded end of pushrod.

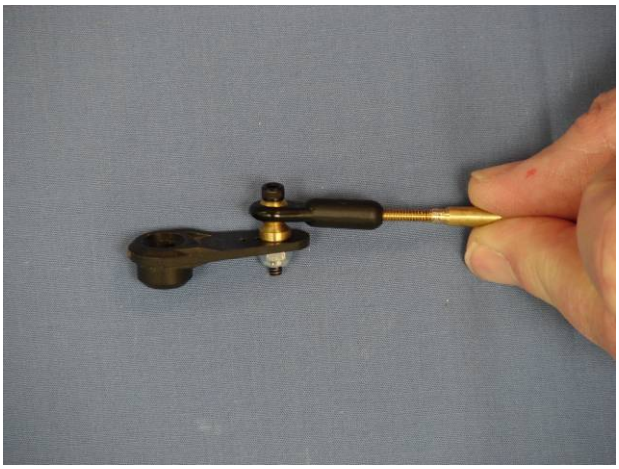
Note: Thread ball link half way onto pushrod to allow for proper adjustment during final installation.



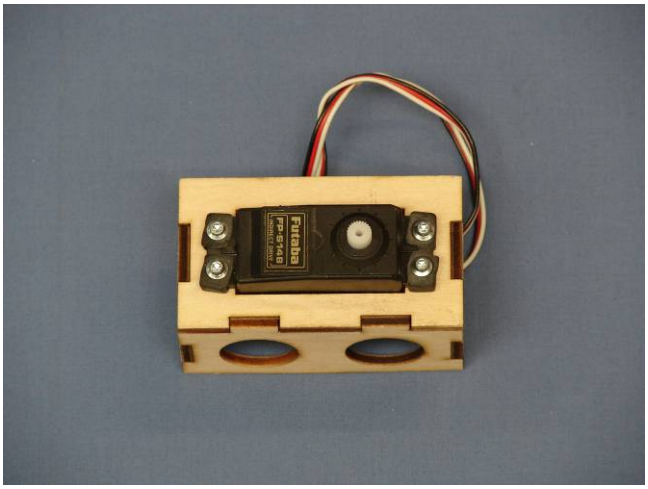
4. Attach throttle pushrod to the carburetor throttle arm with the 4/40 ball link



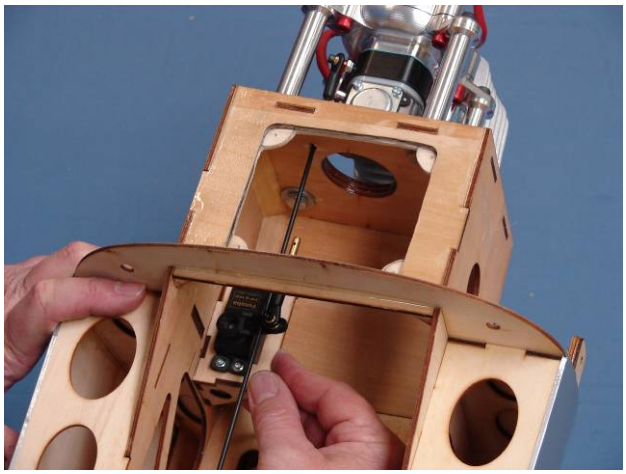
5. Assemble brass threaded coupler to 4-40 ball link and ball link and brass spacer to the servo arm as shown below.



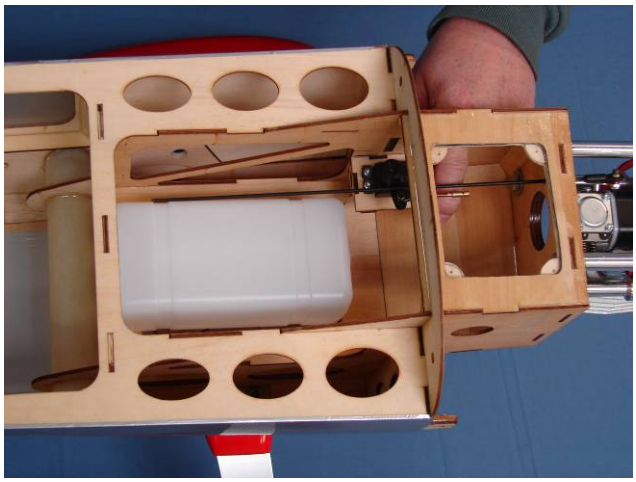
6. Install throttle servo into servo mounting tray.



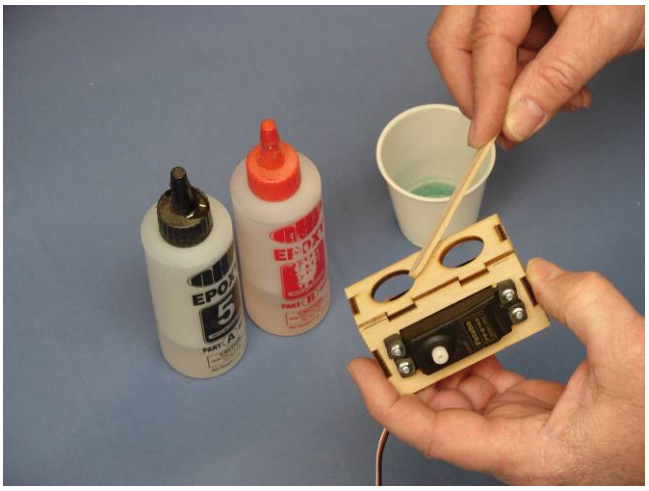
7. Assemble servo arm to servo at 90 degrees to servo. Align throttle servo with throttle pushrod and mark servo mounting location. Ensure the throttle pushrod will line up with the servo output arm with no binding.



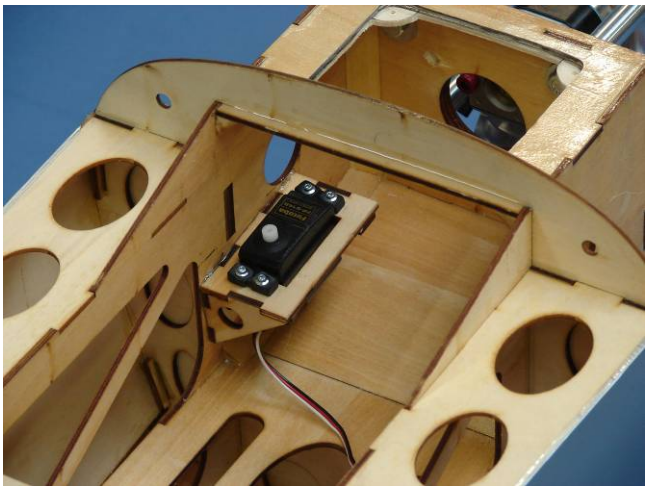
8. Check that mounting position of servo tray will not interfere with fuel tank installation.



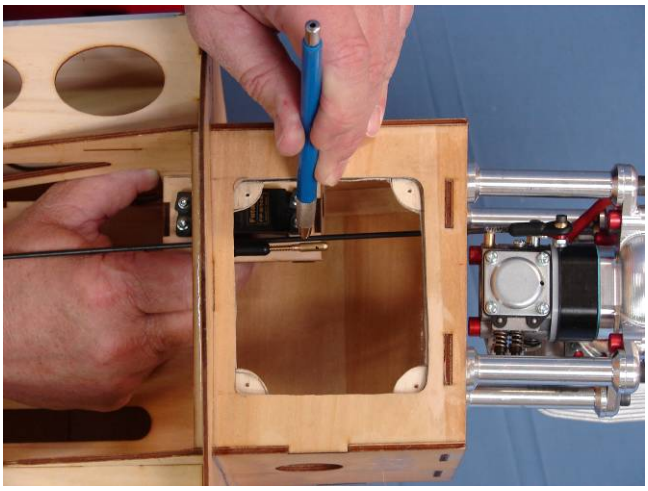
9. Apply 5 minute epoxy to the side of the servo mount that will be in contact with the engine box side.



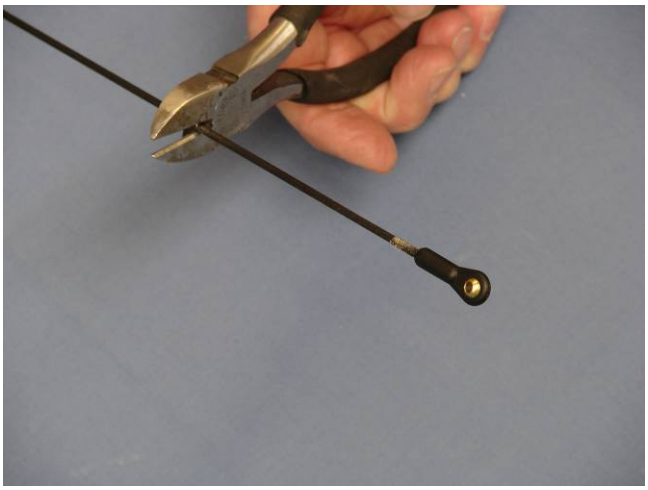
10. Install the servo mount to the inside of the engine box as shown. Use tape or clamps to ensure the servo mount does not move until the epoxy sets.



11. With servo arm still 90 degrees to servo and throttle arm of carburetor in the center or half throttle position. Mark the cut location for the throttle push rod.



12. Remove pushrod from throttle arm on carburetor and cut throttle pushrod to length.



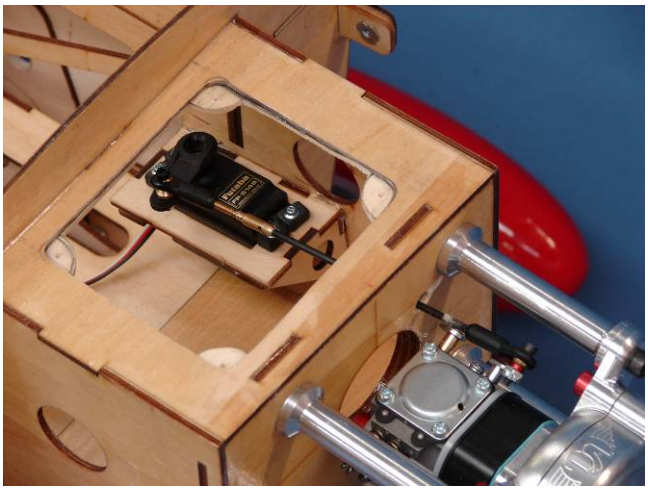
13. Gather the soldering tools as shown below.

Note: For best results we recommend a high quality Silver Solder like “Sta-Brite” silver solder.

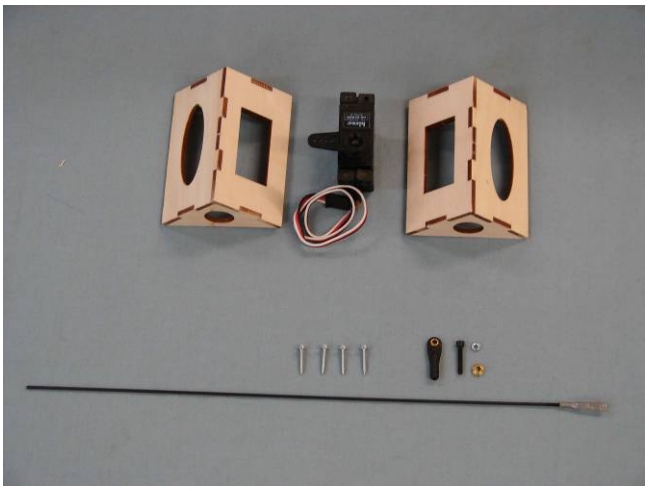
14. Lightly sand end of pushrod for best bond.

15. Solder the threaded brass coupler to the end of the throttle pushrod.

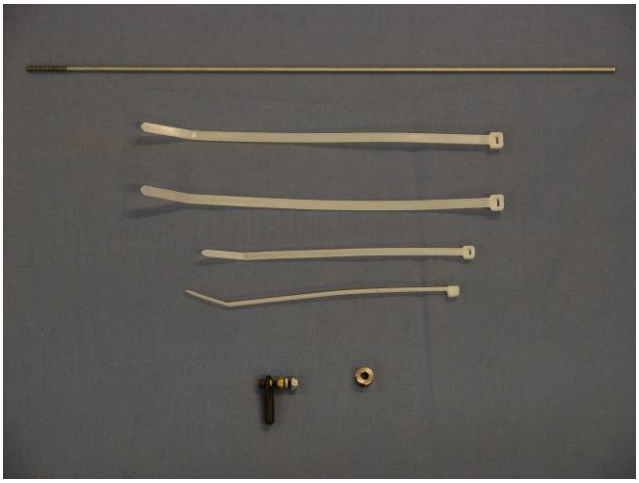
16. Attach the throttle pushrod with the 4/40 ball links and secure. Power up the receiver and throttle servo and adjust pushrod for proper operation. Ensure the servo or rod does not bind or jam at closed or full open positions.



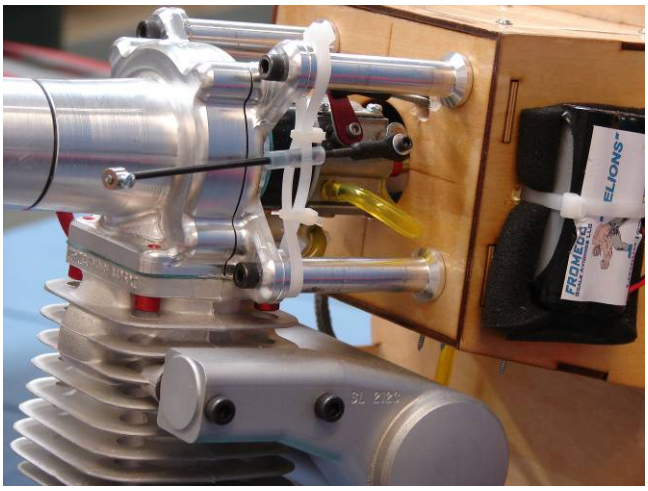
17. If installing a choke servo use the provided mounting tray and hardware shown below. Following same installation steps used for installing throttle servo install choke servo.



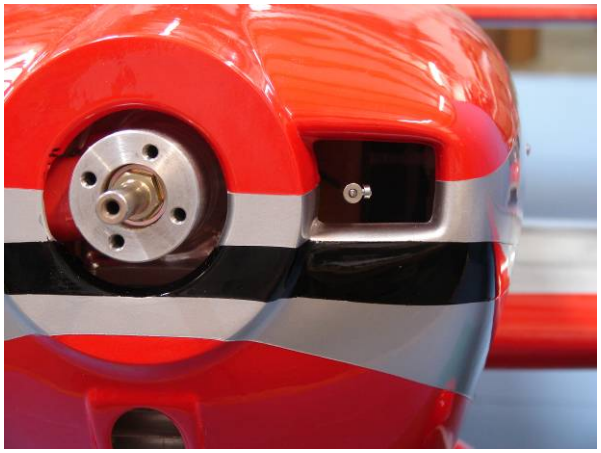
18. If a manual choke will be installed gather the choke pushrod, ball link, wheel collar and nylon ties as shown. Wheel collar and ties are ***Not Supplied.***



19. We recommend installing the carburetor choke pushrod as shown. Use nylon ties to provide support and holding friction for the choke pushrod. Place silicon fuel tubing over the wire pushrod to prevent damage from vibration and provide holding friction. Place a wheel collar on the end of the pushrod to provide a finger grip.

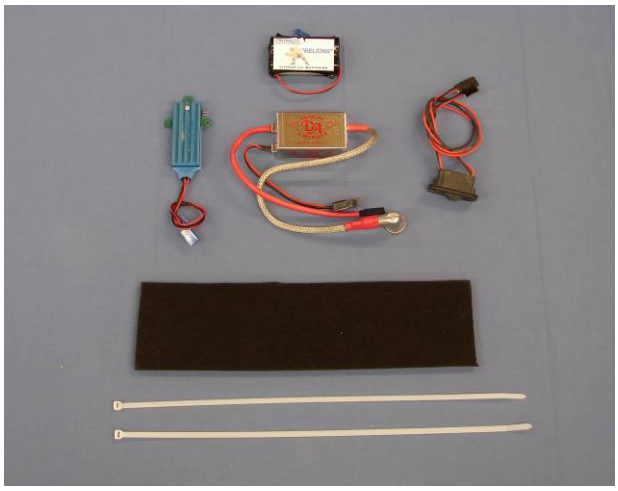


20. Location of manual choke pushrod shown below.

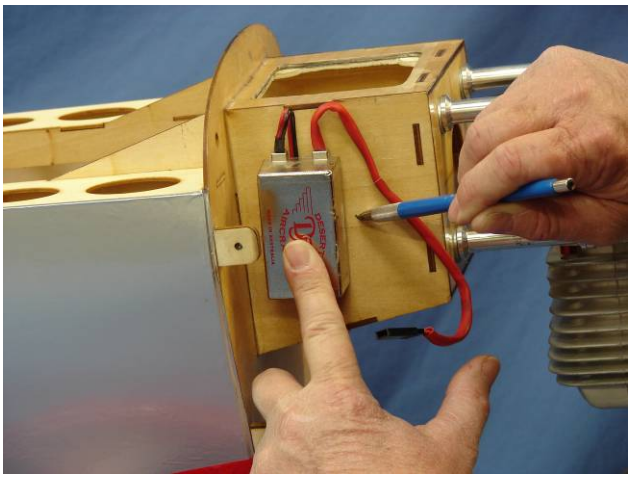


IGNITION INSTALLATION

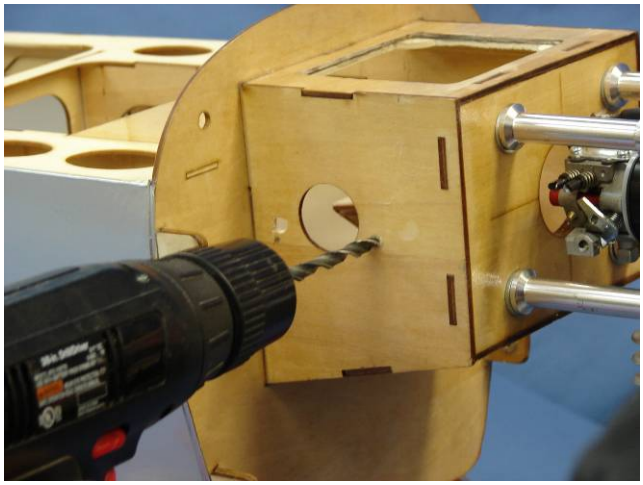
1. Gather the ignition module, battery, switch, regulator and installation parts as shown below.



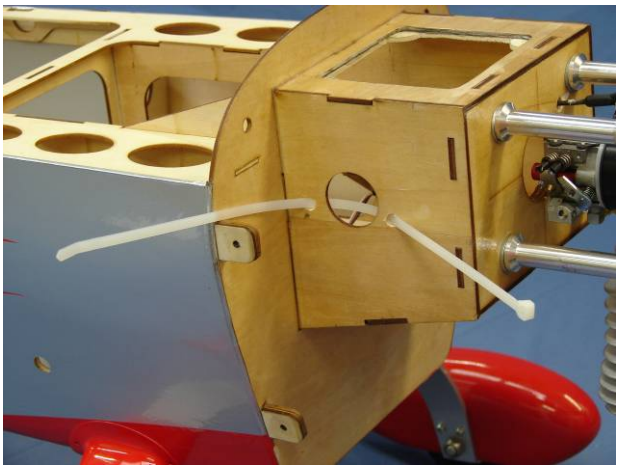
2. Position the ignition module on the side of the engine mounting box and mark the location of the nylon tie holes as shown.



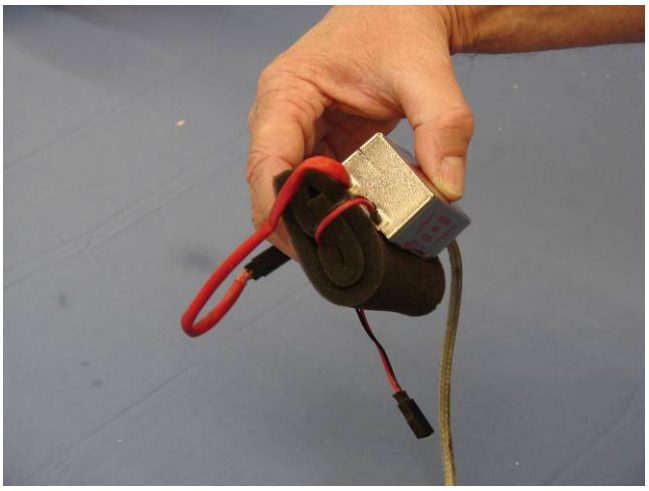
3. Use a 1/8” bit to drill the ignition module mounting holes.



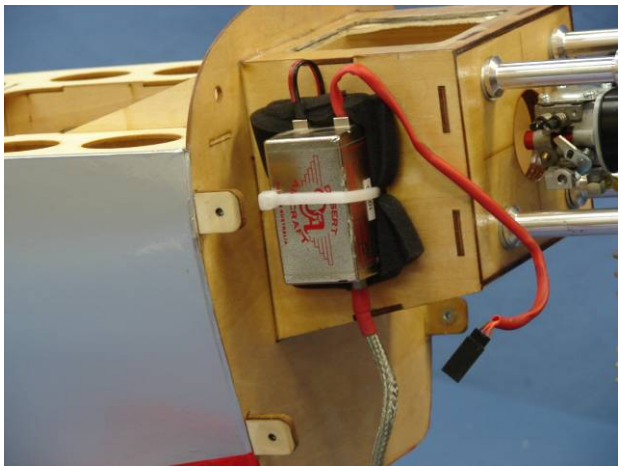
4. Thread nylon tie through mounting holes.



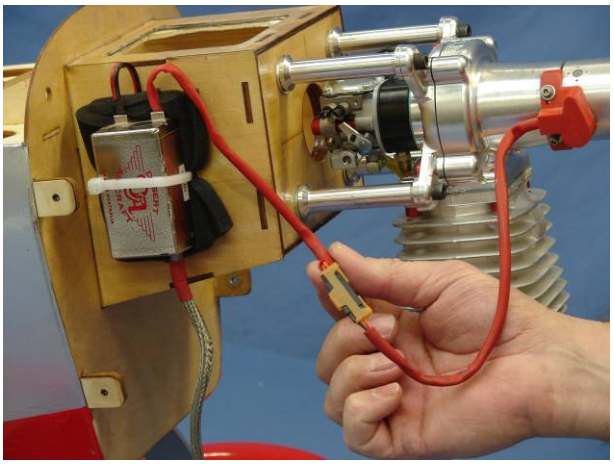
5. Roll the supplied foam rubber to make a 4 layer pad as shown. Make the pad slightly larger than the ignition module.



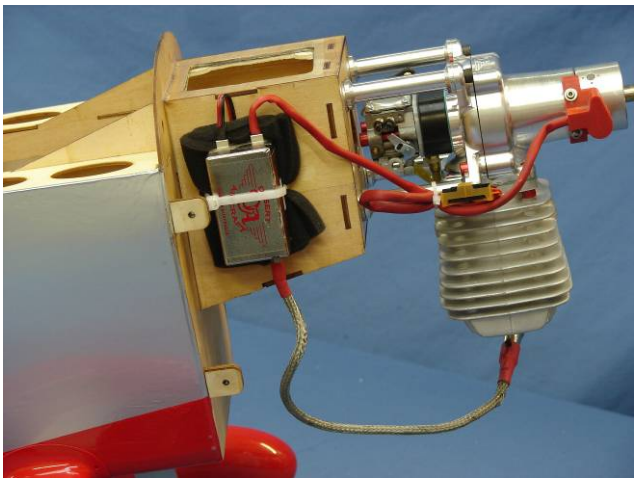
6. Mount the engine ignition module using nylon tie and foam rubber as shown.



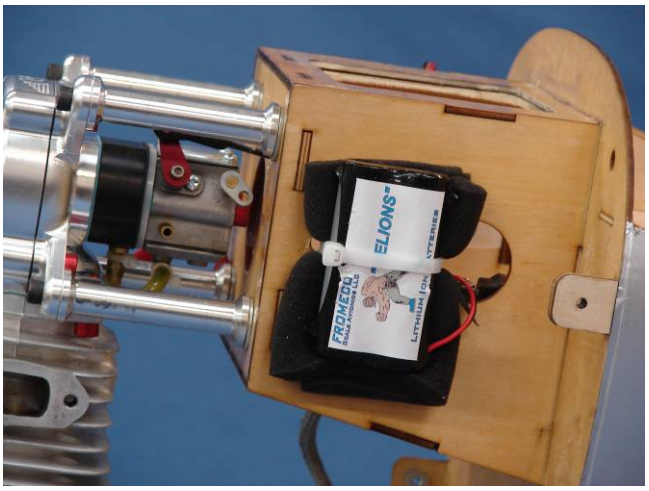
7. Connect ignition module to pickup line of engine. Secure with Safety Clip, safety wire, tape or other method. Ensure the plugs will not come apart from vibration or light tension.



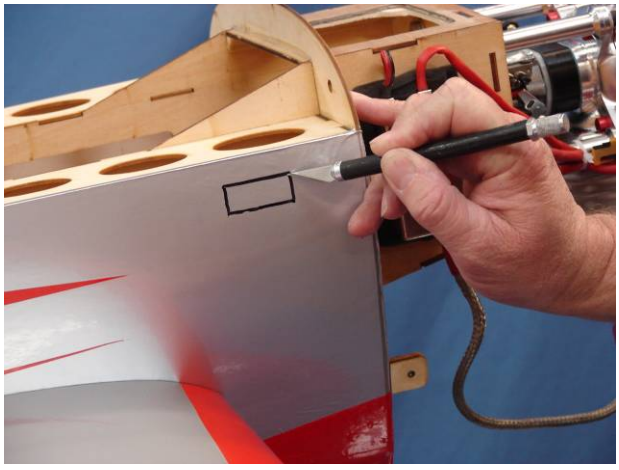
8. Secure ignition wire with nylon ties as necessary.



9. Mount ignition battery on opposite engine box side with nylon tie and foam padding.

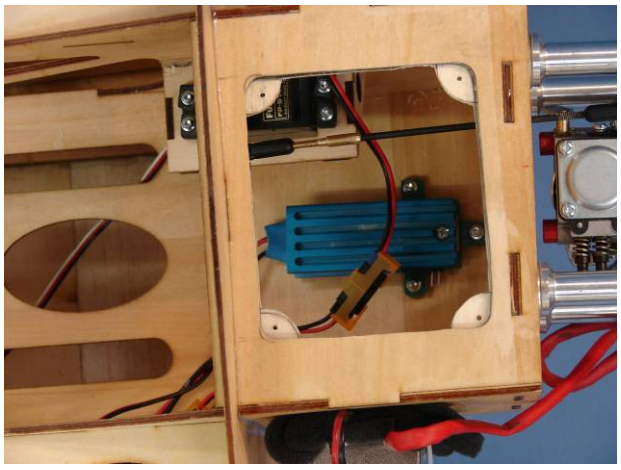


10. Switch mounting location is at builders discretion. Mark the location for the ignition switch using the switch mounting plate for a template. Using a modeling knife cut out the switch hole.



11. Mount switch in accordance with the switch manufacturers instructions and hardware.

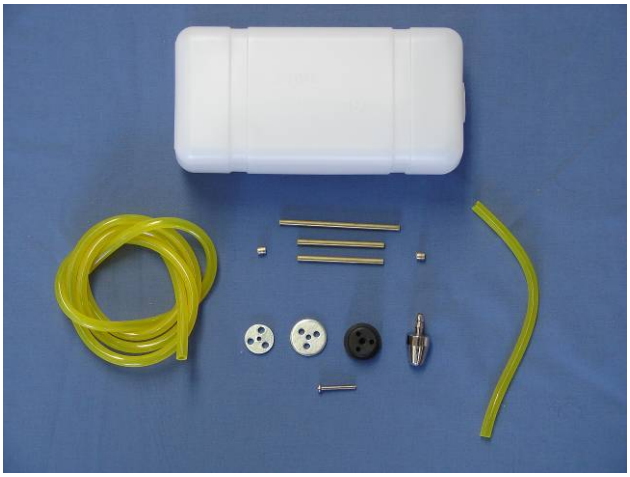
12. Mount ignition regulator as desired. Secure all connectors with tape, safety clip or similar.



FUEL TANK ASSEMBLY AND INSTALLATION

Fuel Tank Assembly

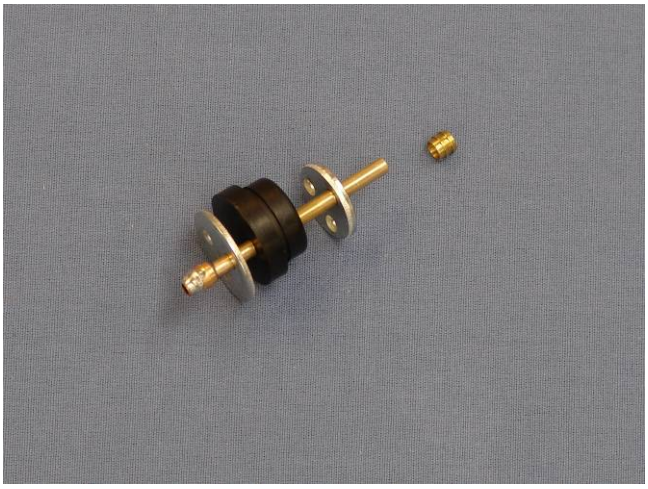
1. Gather the fuel tank parts as shown below. Fuel tank, hardware, brass barbs and fuel tubing.



2. Locate the (2) supplied brass fuel barbs. Solder a brass fuel barb to the fuel line pick up tube. This will keep the weight of the fuel clunk from pulling the fuel line off the brass tube.

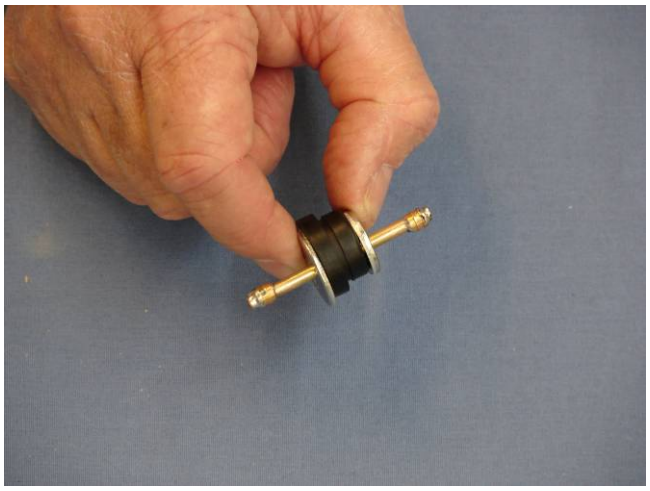
Note: No brass barbs are required for the air vent lines.

3. Assemble the fuel pick up line, rubber stopper and metal end caps. As shown below.



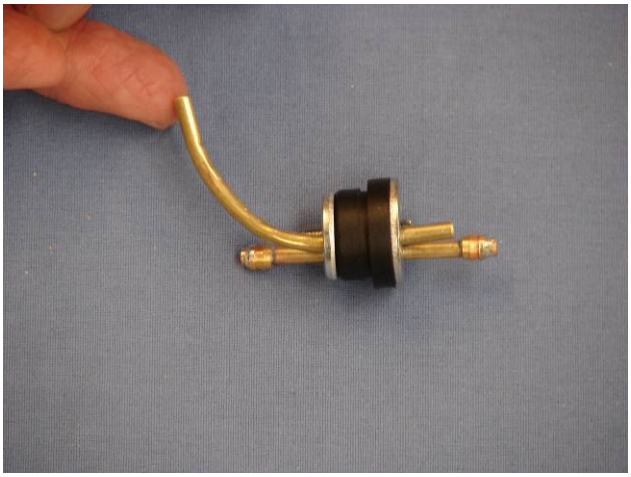
4. Solder a brass fuel barb to the other end of the fuel pick up line.

5. Final assembly of rubber fuel stopper with fuel pick up tube shown below.



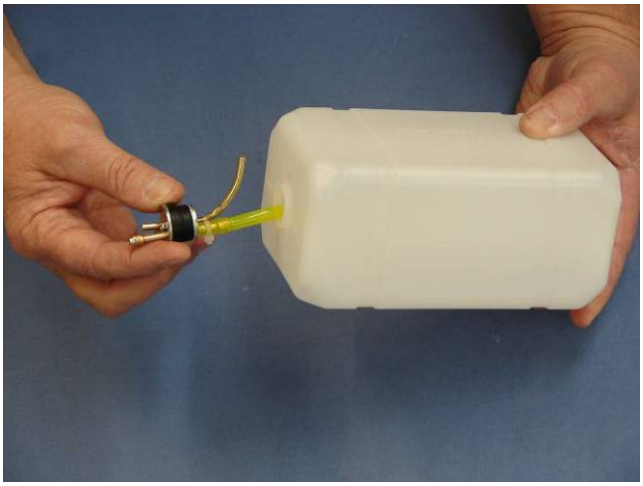
6. Install air vent tube into rubber stopper and bend upward.

Note: No brass barbs are required for the air vent tube.

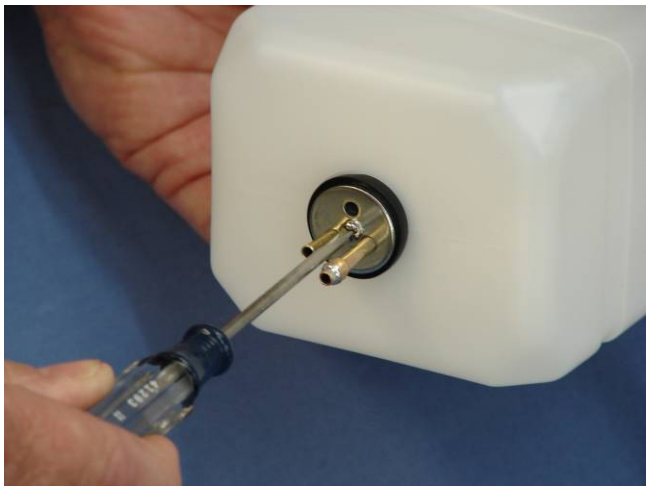


7. Install the fuel tubing and clunk. Secure the fuel tubing with nylon ties to the pick-up tube and clunk.

8. Insert the rubber stopper assembly into the tank with the vent tube at the top of the tank.



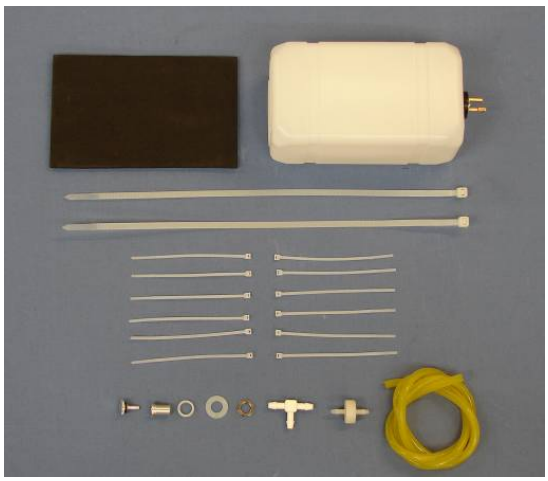
9. Secure the rubber stopper with set screw. Take care not to strip threads by over tightening set screw.



Fuel Tank Installation

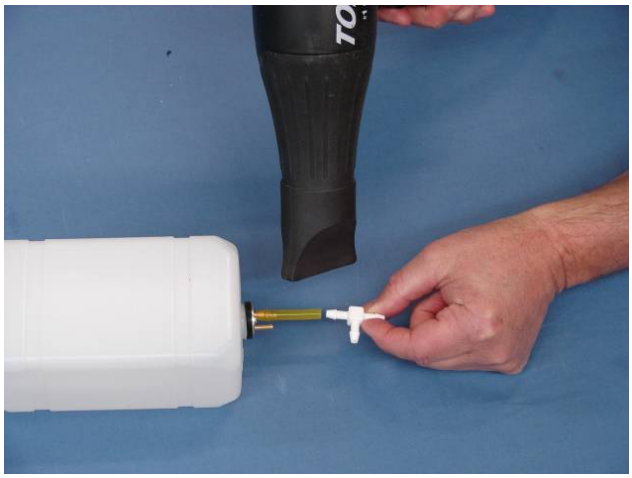
1. Gather the fuel tank parts as shown below. Fuel tank, fuel tubing, foam rubber, fuel "T", fuel filler dot, fuel filter and nylon ties.

Note: The fuel "T", fuel filter and filler dot are not supplied, but are available through Aeroworks.



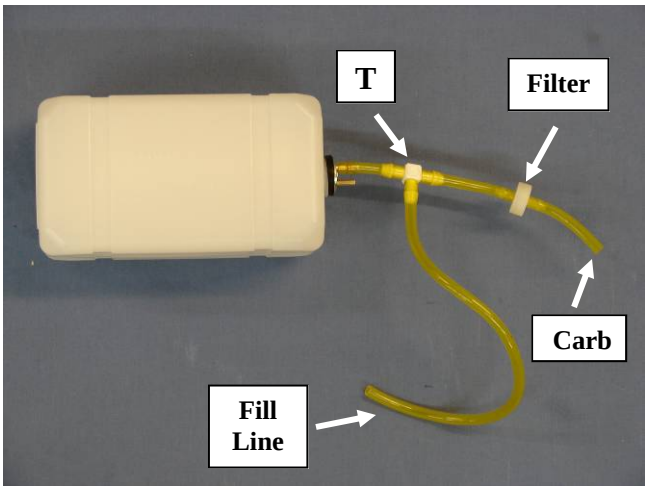
2. Install a short piece of fuel line and the fuel "T" to the fuel pick up tube.

Note: Using a heat gun to soften the fuel line will help with the installation of the fuel "T".



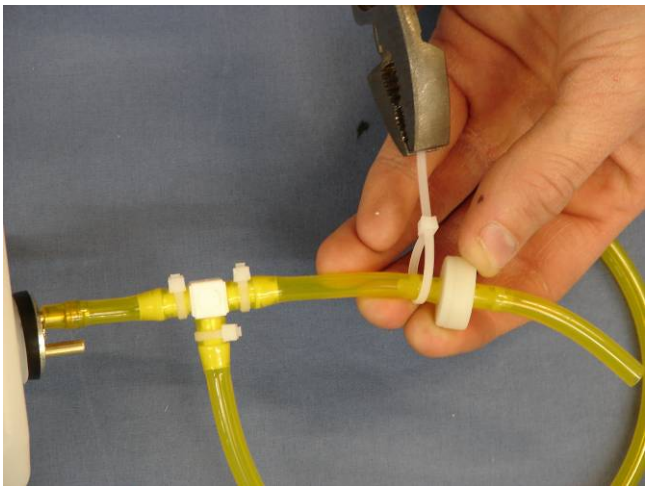
3. Install the fuel filter, fuel pick up and fuel filler lines to the fuel tank.

Note: It is recommended you always use a fuel filter in the fuel line to the carburetor.

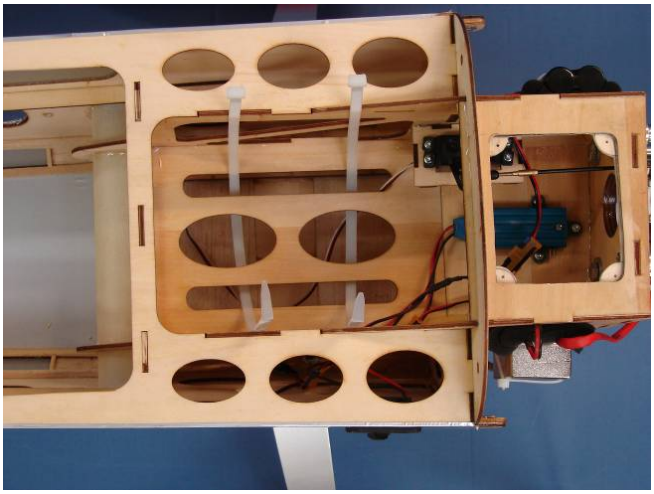


4. Use small nylon ties to secure fuel line.

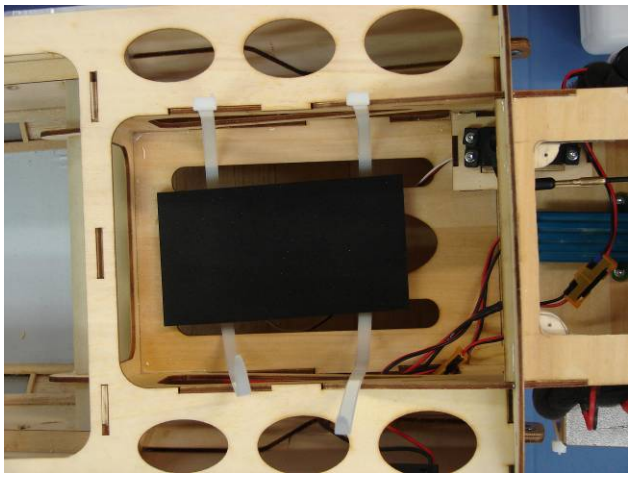
Note: Gasoline will cause the fuel line to expand over time. Always secure fuel lines with nylon ties to prevent them from pulling off during flight.



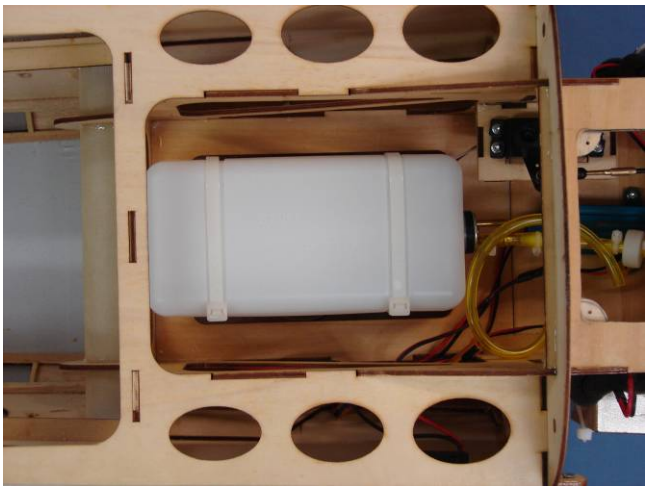
5. Thread nylon ties under tank mounting plate and center in position.



6. Install foam rubber pad for fuel tank to rest on. Foam rubber will help prevent fuel from foaming or getting air bubbles from engine vibration.



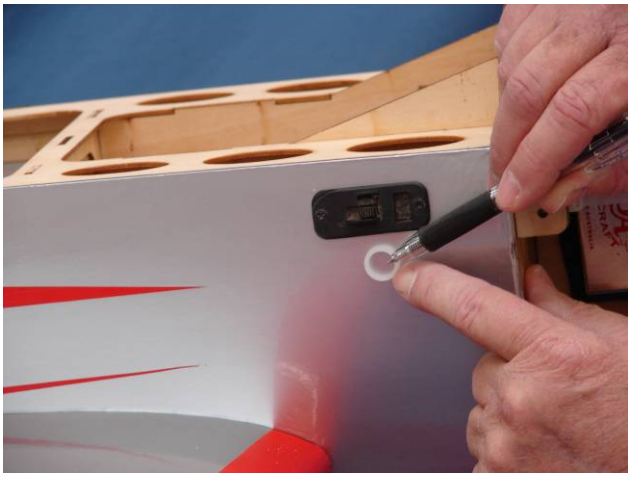
7. Install the tank. Run the fuel pick up line to the engine. Secure the tank with the two long nylon ties trim away any excess nylon tie as shown.



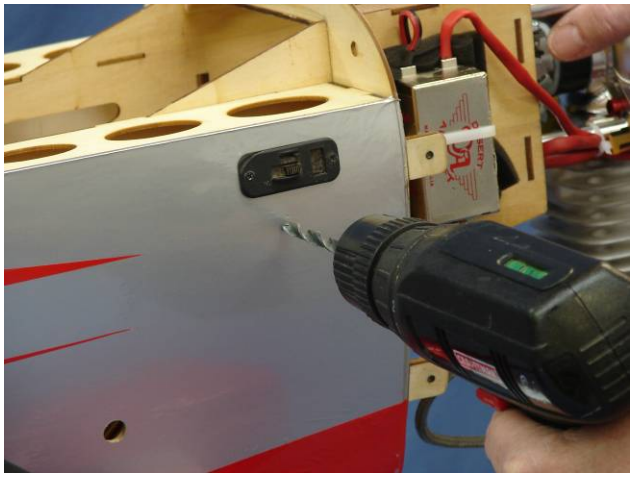
8. Gather the fuel filler dot and drill bits as shown below.

Note: We recommend you start with a smaller size drill bit then increase the bit size to the correct size to fit your filler dot. This will help prevent the fuse side from splitting or cracking.

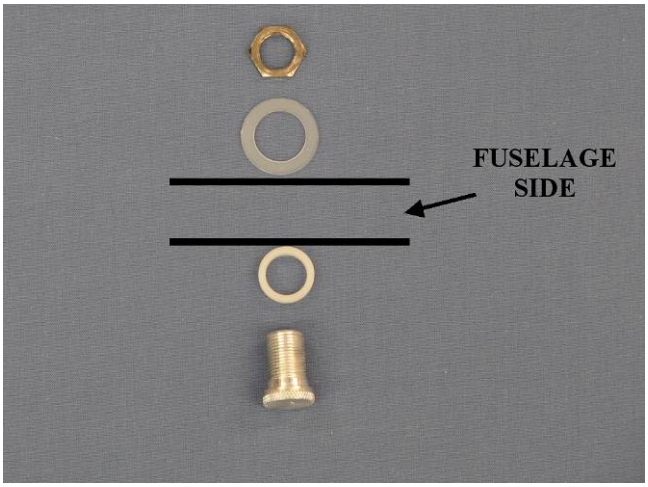
9. Mark location of fuel filler dot.



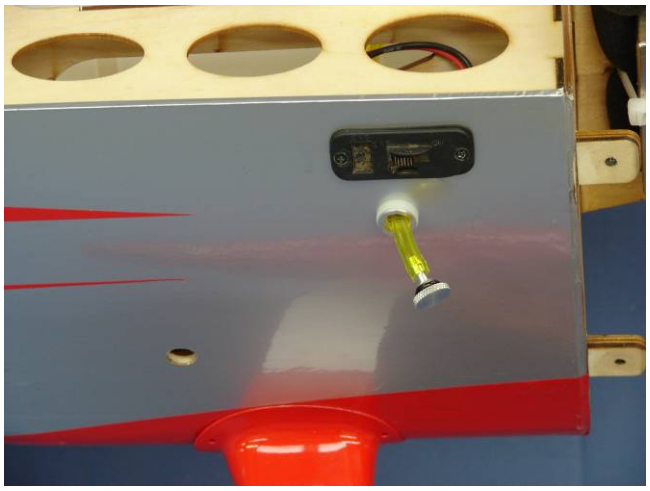
10. Drill hole to accommodate fuel filler dot.



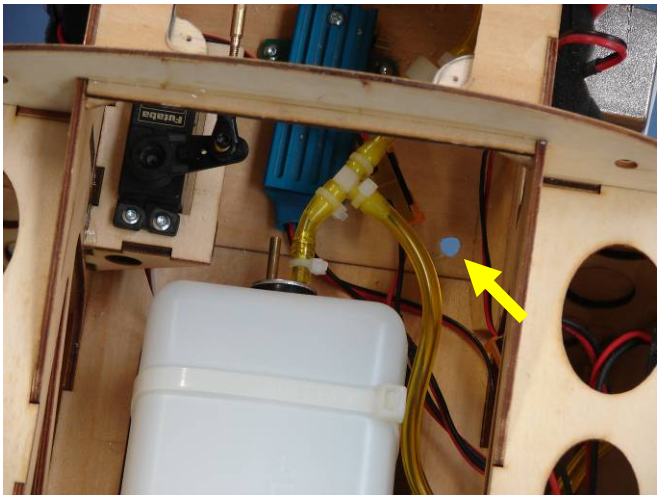
11. Correct installation of filler dot shown below.



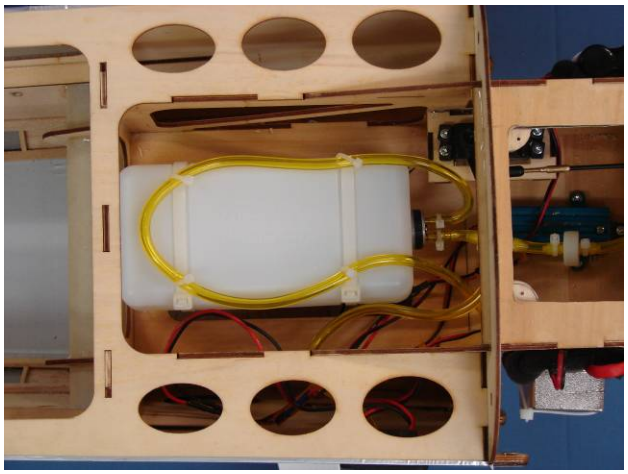
12. Feed filler line through dot and plug line into filler plug as shown.



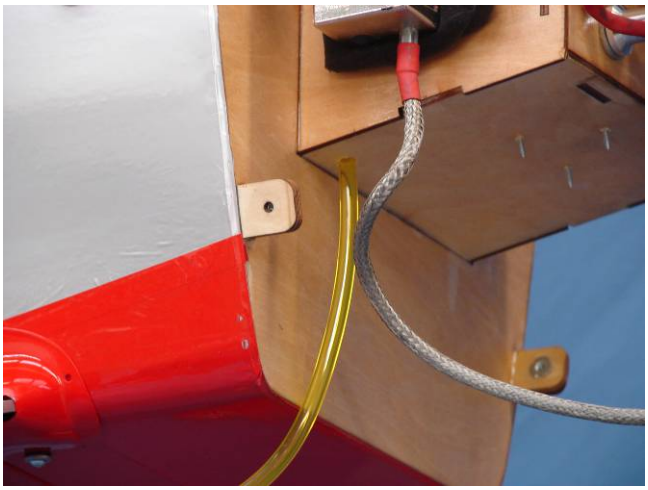
13. Determine the vent line hole location at the engine box floor. Mark and drill a hole in floor.



14. Route the vent line on top of the fuel tank and secure with small nylon ties as shown. This will stop excess fuel from draining out the vent line during an extended down line or when lifting the tail.



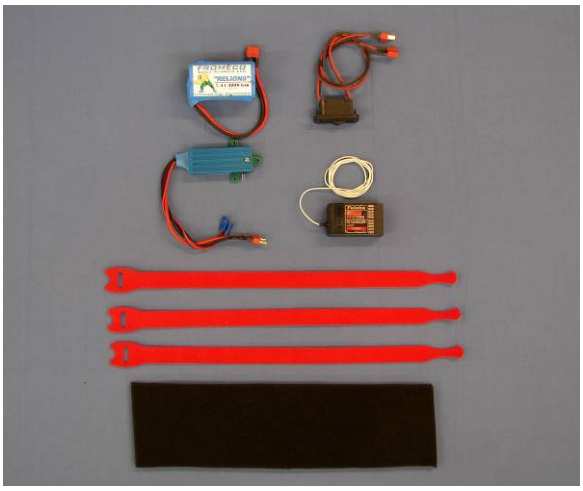
15. Feed vent line tubing through engine box floor. Cut off excess fuel line. It is important to leave enough fuel line to exit out the bottom of the cowling.



16. Secure fuel pick up line to engine carburetor with small nylon tie.

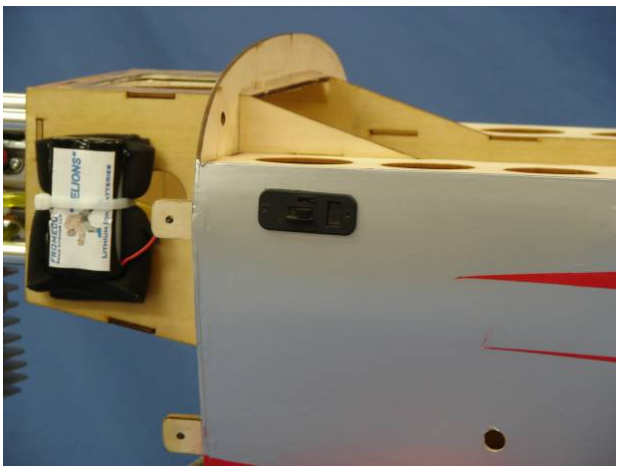
RADIO INSTALLATION

1. Gather the radio components as shown below. Battery, Switch, Regulator if used, receiver, foam rubber and Velcro one wrap straps.

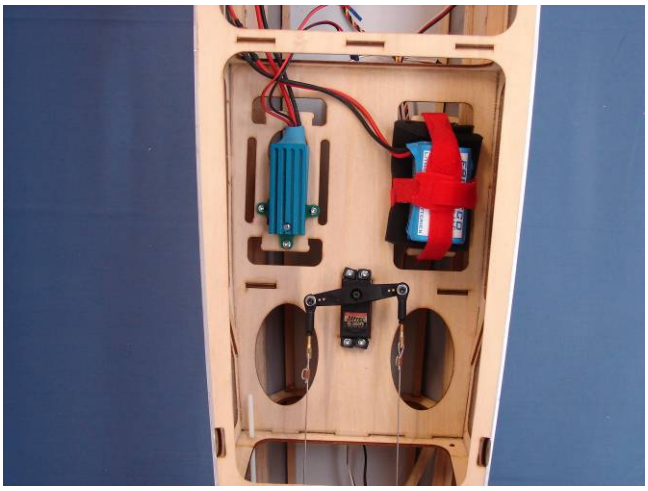


2. Mount radio switch in accordance with the switch manufacturers instructions and hardware.

Note: Ensure switch does not interfere with wings or cowl installation.

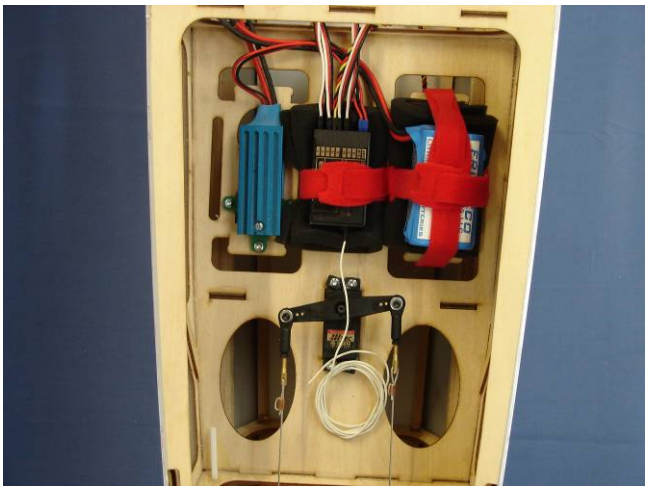


3. Install regulator in accordance with manufacturers recommended installations. Install battery using foam padding and Velcro one wrap straps.



4. Proper installation of battery using two Velcro straps is shown below.

5. Install receiver using foam padding and Velcro one wrap strap as shown.



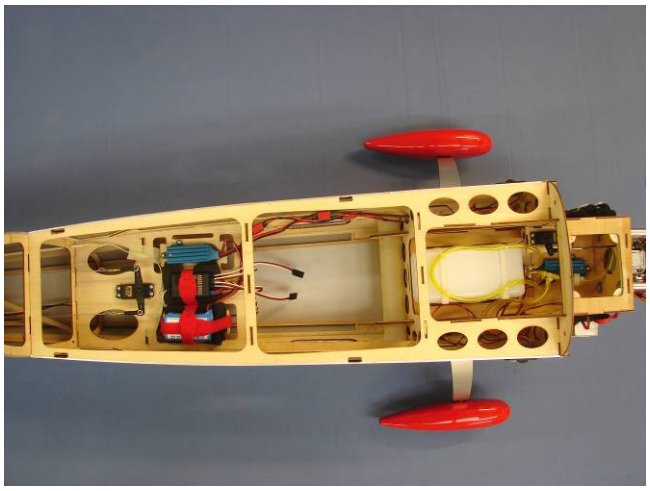
6. Install the receiver antenna in the pre-mounted antenna tube. Push the antenna into the antenna tube, be sure that the antenna is all the way into the tube.

Note: Placing baby powder on the antenna will aid in sliding it through the tube.

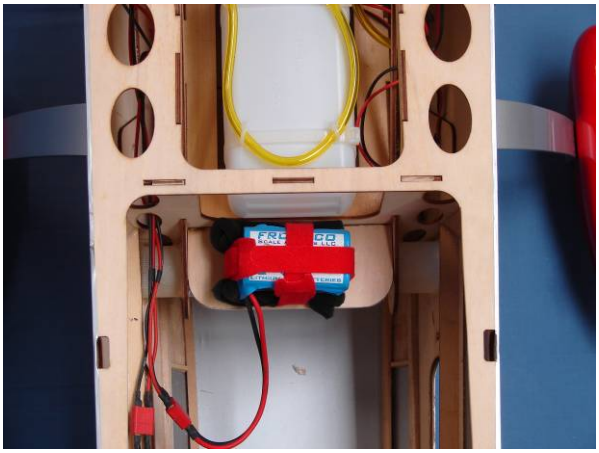
7. Place tape on the antenna and tube, this will keep the antenna from backing out of the tube.

8. Finished antenna installation shown below. Tape antenna to fuse floor if desired.

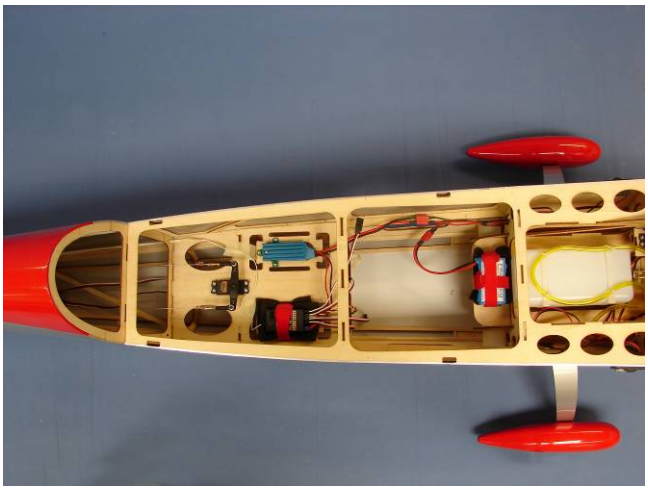
9. Typical radio installation shown for heavier engine selections.



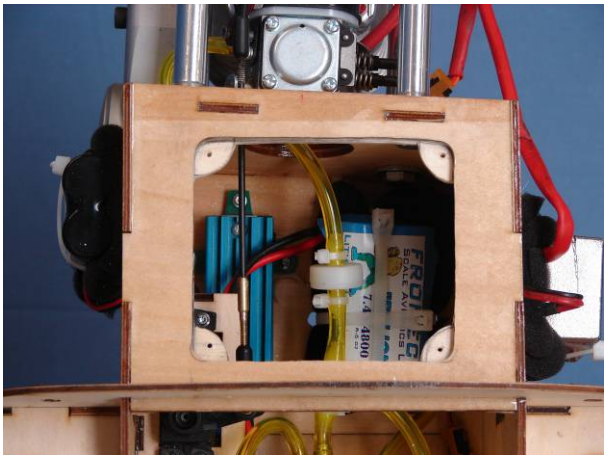
10. Mount radio battery to battery floor behind fuel tank if your engine of choice is in the mid to light weight category and you will require more nose weight to achieve the recommended C.G. location.



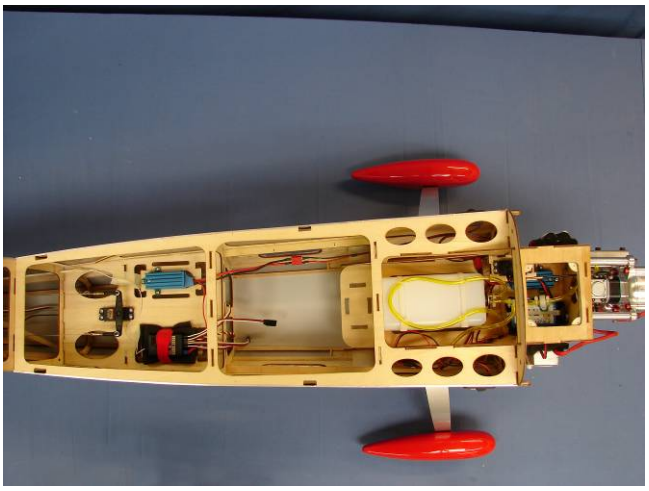
11. Typical radio installation shown if using a mid to light weight engine.



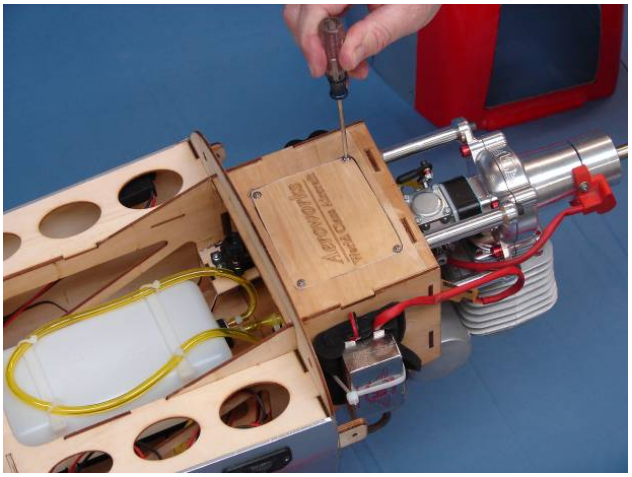
12. Mount radio battery in engine box compartment if your engine of choice is in the light weight category and you will require more nose weight to achieve the recommended C.G. location.



13. Typical radio installation shown if using a light weight engine.

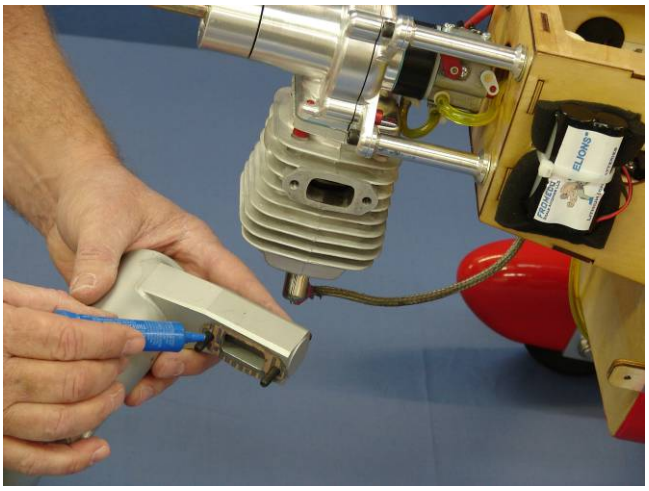


14. Reinstall engine box top hatch cover.



MUFFLER INSTALLATION

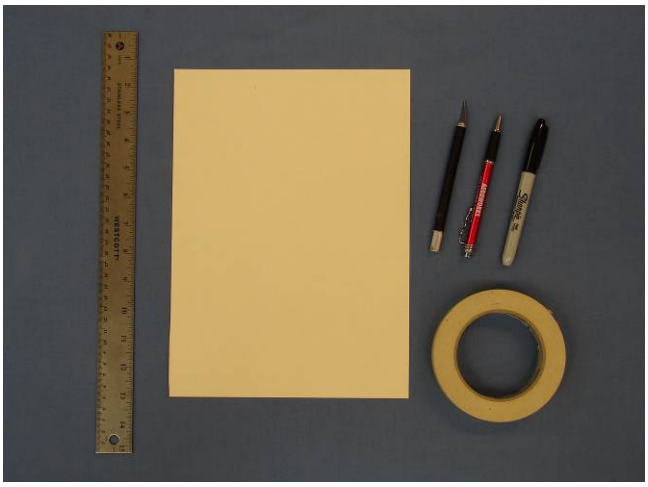
1. Use blue Loctite to install the Pitts muffler bolts. Remember to always use the engine manufacturer suggested gasket for proper seal.



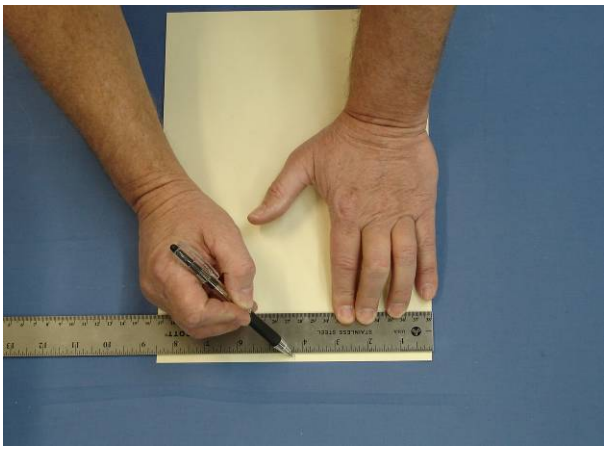
2. Securely tighten the muffler bolts to the engine.

COWL INSTALLATION

1. Gather the materials as shown below. Template material, hobby knife, ruler, tape, marker and pencil.

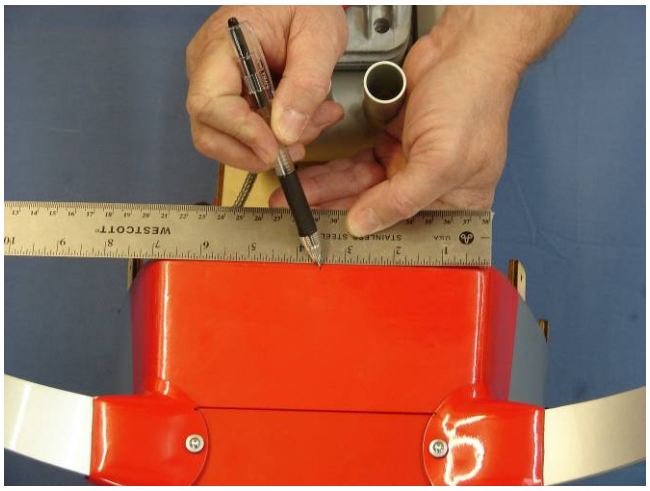


2. Measure and mark the center of the template material as shown.

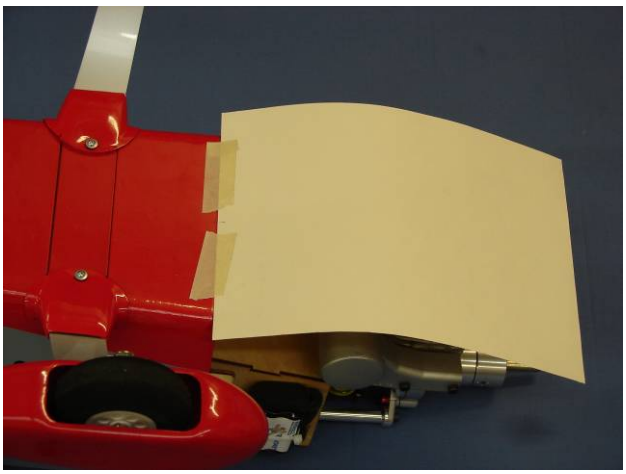


3. Measure and mark the center of the bottom of the fuselage as shown. Mount cowling to fuse and transfer center line on fuse to bottom of cowl.

Note: You will use this center mark during a later step when aligning template with cowl.

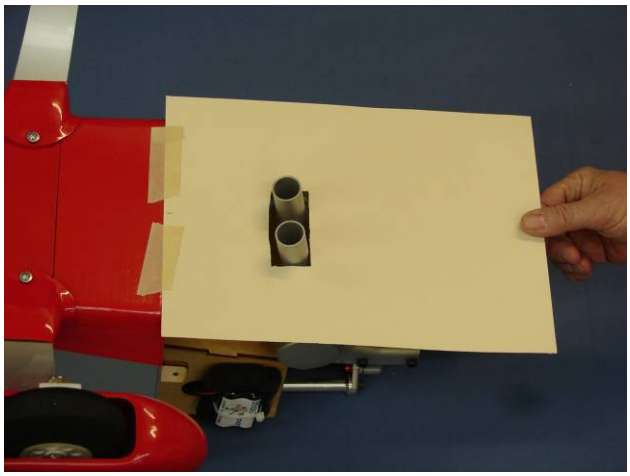


4. Aligning center lines of template and fuse. Tape the template to the bottom of the fuse with the back edge of the template flush against the aft edge of the recessed cowl mounting ring.

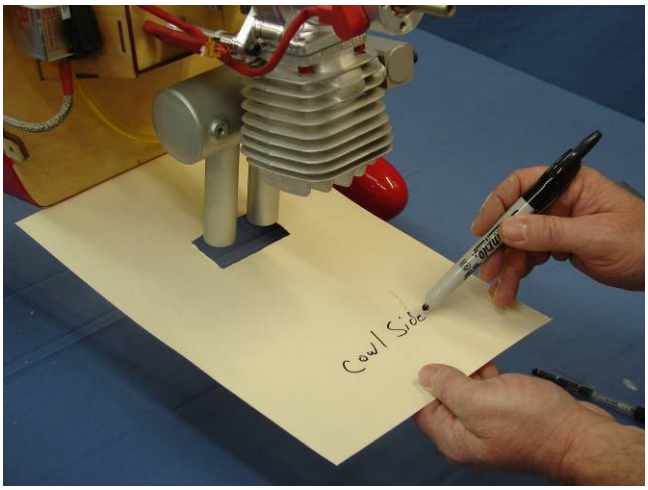


5. Using a hobby knife roughly cut a hole for the muffler exhaust stacks to pass through.

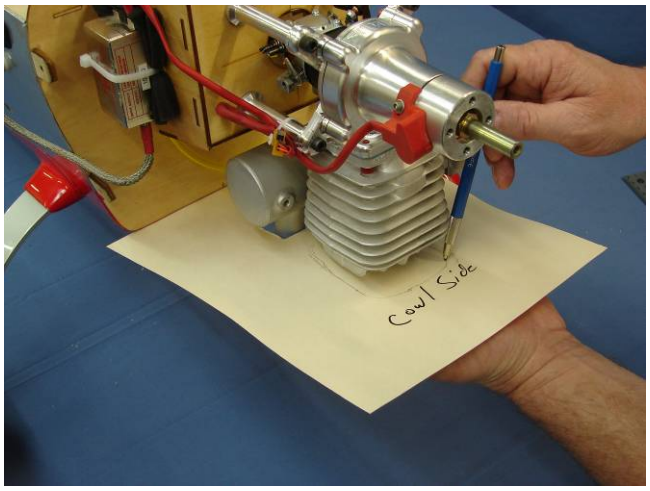
Note: This will allow you to pull the template up next the engine cylinder head.



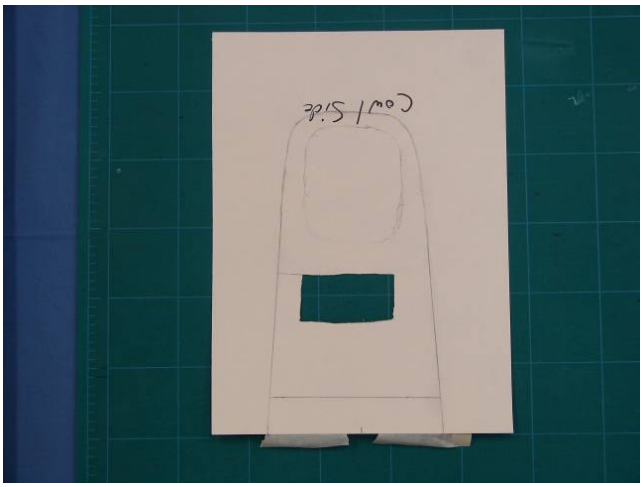
6. Mark **"Cowl Side"** on the top side of the template. It is very important that the template does not change position when attached to the cowl.



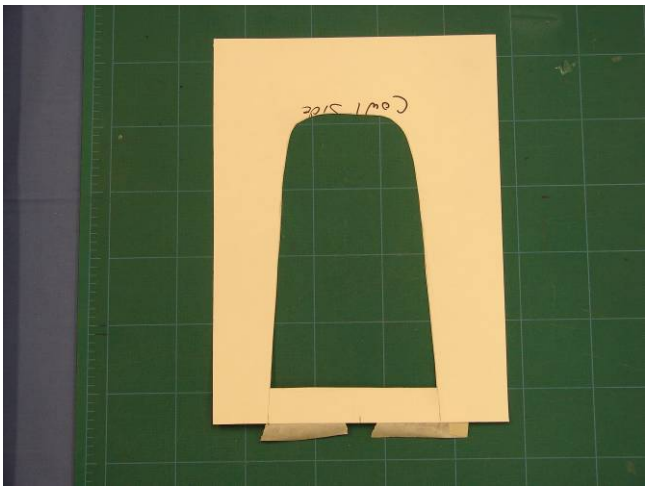
7. Trace around the head of the engine being careful to keep the template in the same location.



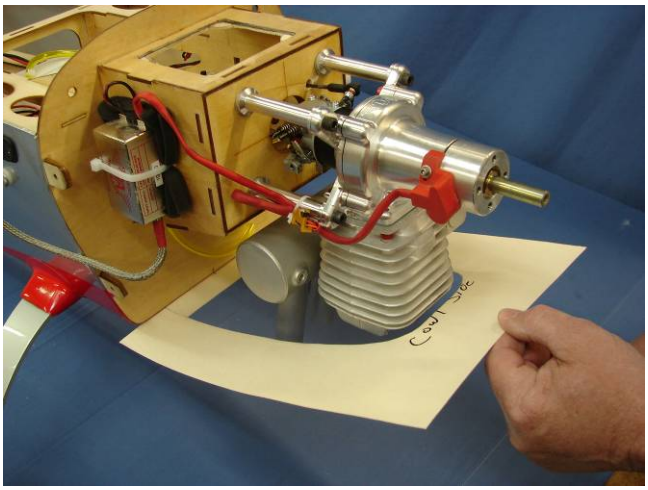
8. Remove template and mark the hot air exit hole as shown. We recommend enlarging the hole for the cylinder head approximately 1/4" to provide adequate cooling. Measure and mark 1 1/2" from the rear of the template.



9. Use a hobby knife to cut out the hot air exit opening as shown.

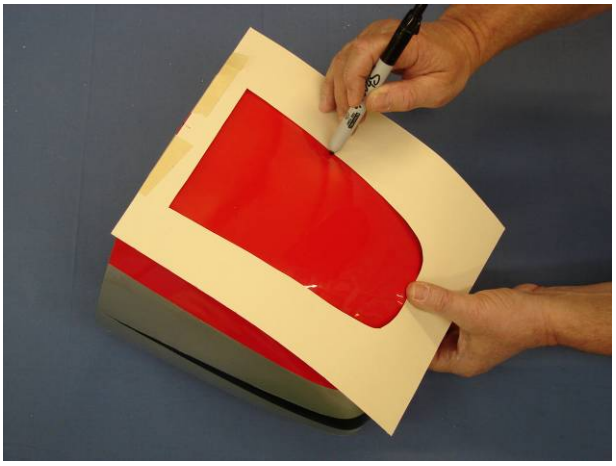


10. Check the fit of the template at this time. It may be necessary to make small adjustments to the cutout to get it to fit properly.



11. Fit template flush with rear of cowl and align center marks of template and cowl. Tape template to the bottom of cowl. Use a felt tip marker to transfer the template cutout pattern to the cowl and mark cut location.

Note: Pay close attention to the marker you choose. Some permanent markers may not be easily removed. Also, When using rubbing alcohols or other paint removers, always test on painted parts before using!

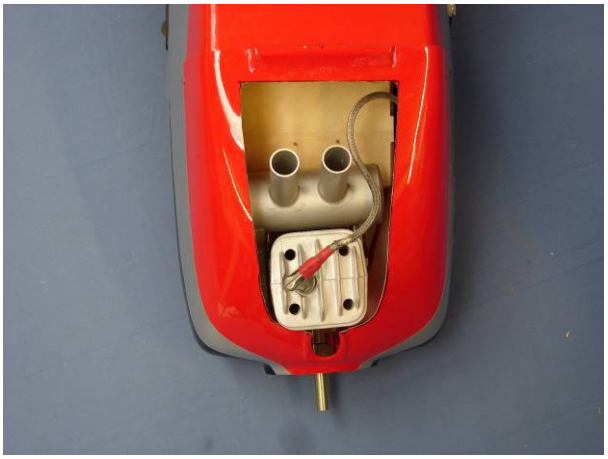


12. The cowl should be marked as shown. Be sure to mark all of the lines clearly and carefully to aid in cutting.

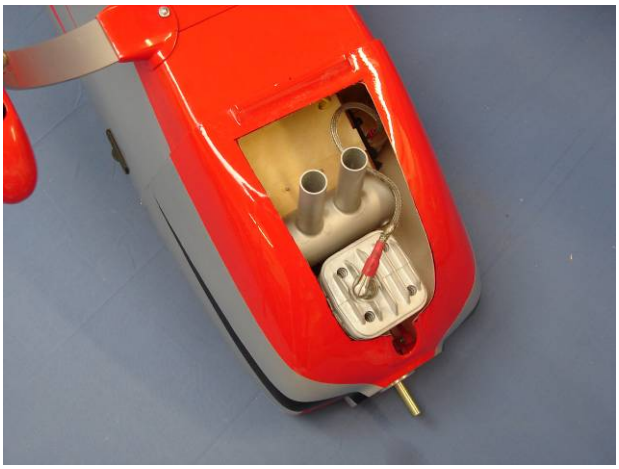
13. Remove the template and use a rotary cutting tool and sanding drum to cut out the openings in the cowl.

Note: Take care not to cut or scratch the cowl.

14. Install the cowl and check that everything fits correctly and does not come in contact with the cowl. If needed enlarge the cutouts and test fit again until everything fits correctly.

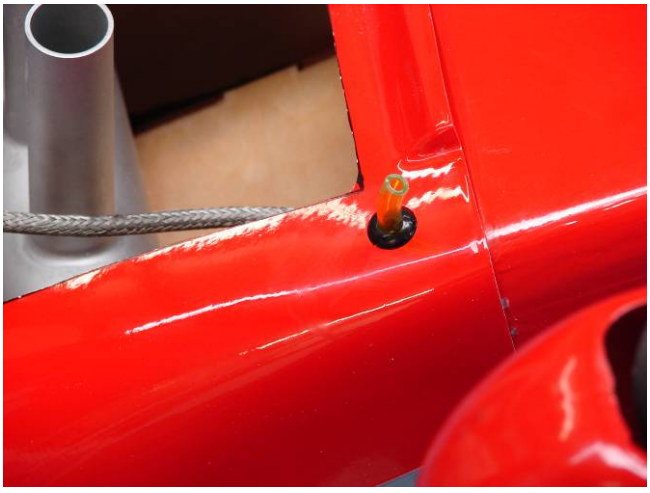


15. Another view of finished cowl installed on fuse.

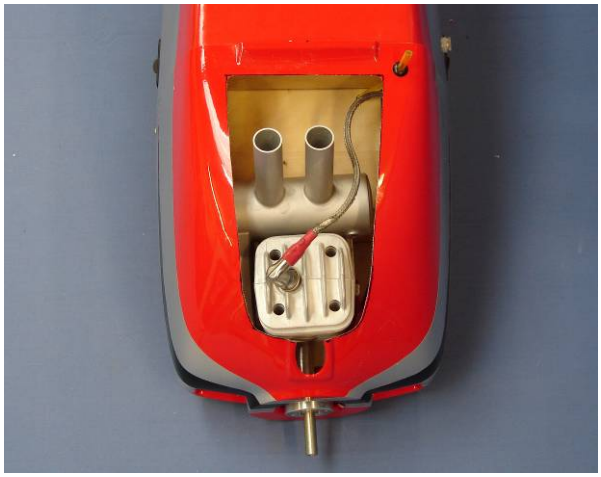


16. Install fuel vent line on bottom of cowling.

Note: Use rubber grommet to keep fuel line from chaffing and cowl from cracking.



17. Finished cowl installation show.

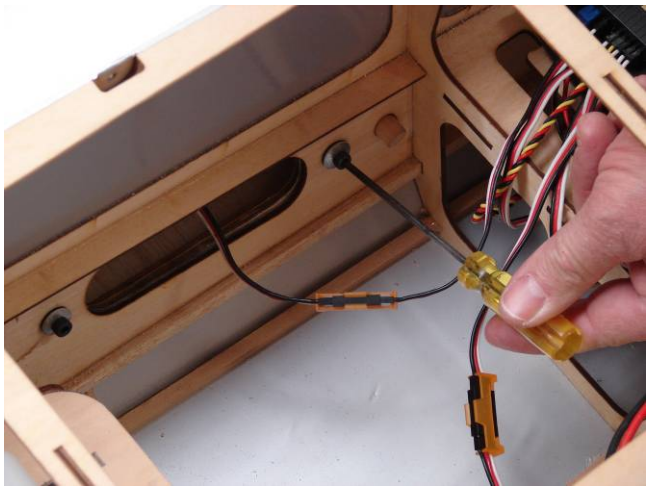


18. Different angle of finished cowl installation shown.

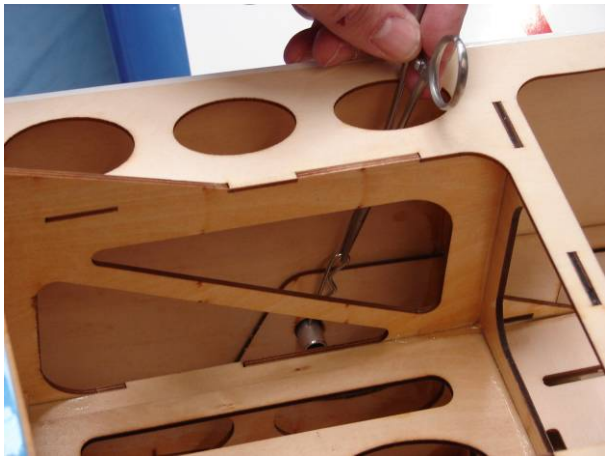
PRE-FLIGHT PREPARATION

1. Gather (4) 8-32 wing mounting bolts, (4) #8 rubber backed washers and (4) hairpins for preparation of mounting the wings.

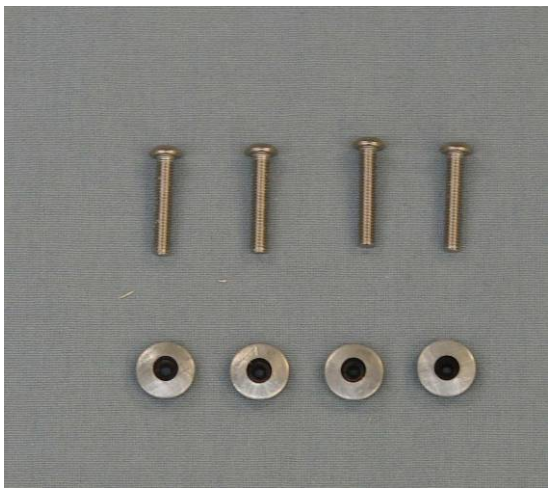
2. Slide the wing tube in the fuse wing tube sleeve. Slide the wings on the wing tube and plug in the aileron servo connectors. Slide the rubber backed washers on the wing mounting bolts and insert bolts through the fuse side and into the wing root blind nuts. Tighten snugly but do not over tighten and crack the fuse or wing root wood.



3. Install hairpins into both front and rear aluminum anti-rotation wing dowels for a second method of wing attachment.

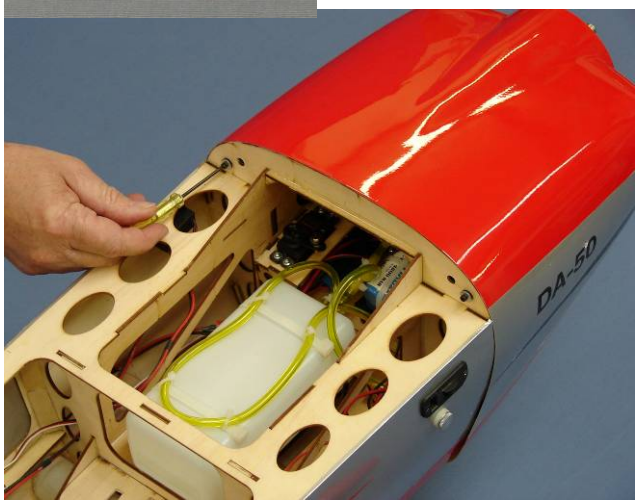


4. Gather (4) 4-40 stab mounting bolts and (4) #6 small rubber backed washers.



5. Slide the stab tubes in the fuse stab tube sleeves. ***(Long Back / Short Front)*** Slide the stabs on the stab tubes and connect pushrod to servo arm. Slide the rubber backed washers on the stab mounting bolts and insert bolts through the stab mounting tabs and into the fuse blind nuts. Tighten snugly but do not over tighten and crack the stab mounting tabs or the fuse sides.

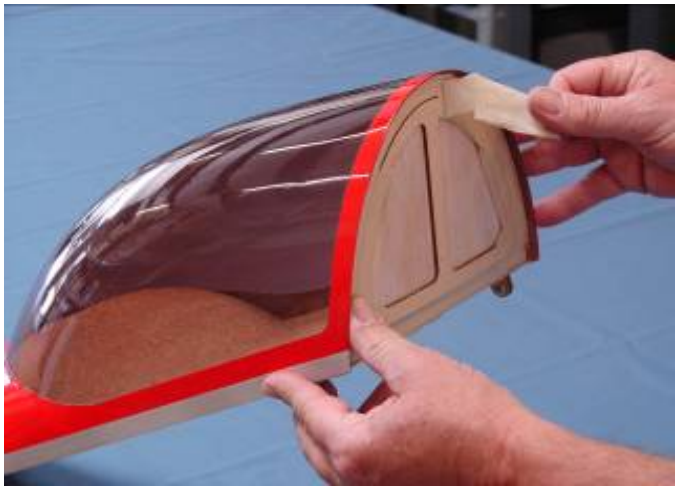
6. Gather (4) 4-40 cowl mounting bolts and (4) #6 small rubber backed washers.



7. Mount the cowl using the cowl mounting bolts and rubber backed washers. The rubber backed washers are to prevent the fiberglass cowl from cracking and to prevent mounting bolts from loosing from normal engine vibration.

8. Remove the tape holding in the canopy bulkhead hatch.

Note: Some models may not have this removable hatch. If your model does not continue to the next steps.

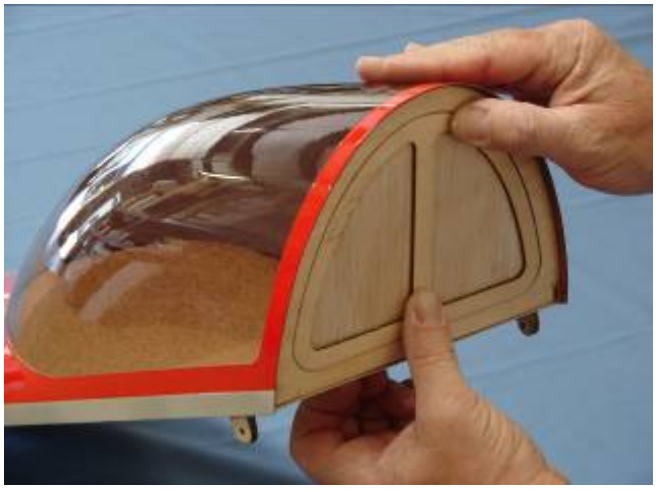


9. Remove the canopy bulkhead hatch as shown. If desired an optional instrument panel and pilot may be installed.

Note: Instrument panel and pilot are not supplied in the kit but may be purchased separately from Aeroworks.

10. Reinstall the canopy frame hatch and glue in place as shown. Use care not to get glue on the clear plastic canopy.

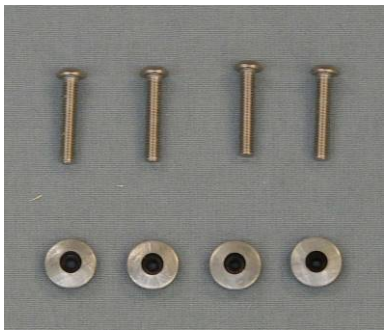
Note: Epoxy or thick CA glues are recommended.



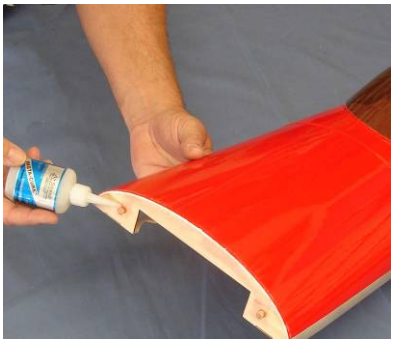
11. Gather the (4) 4-40 hatch mounting bolts and (4) #6 small rubber backed washers.

Note: It is highly recommended you apply thin CA glue to the front hold down dowels. This is a High vibration area and can loosen the front dowels.

Always check the front dowels are secure before each flying session



Us thin CA to secure front hatch hold down dowels



12. Slide the rubber backed washers on the hatch mounting bolts and insert bolts through the hatch mounting holes and into the fuse blind nuts. Tighten snugly but do not over tighten and crush the hatch or the fuse sides.

DECAL INSTALLATION

Decal installation

1. Decals supplied with the kit may vary from the photos below. Decal installation instructions are for reference purposes only.

   Gather supplied decals, transfer tape, ruler, scissors, hobby knife, plastic squeegee or credit card, Windex or Application fluid like ***Rapid Tac***. Also, a solution of 1 drop of dish detergent to a cup of water sprayed on the model will assist in proper positioning.

Note: Clean surface and tighten all covering before any decals are applied.

2. Factory placement of decals shown.

3. Factory placement of decals shown.

4. Using rubbing alcohol or glass cleaner. Clean all areas before any decal installation.

Note: Decals and model shown in following steps may very from your model.
Decal installation will be similar

5. Tighten all covering prior to any decal installation.

6. Remove backing from decal sheet.

7. Spray model surface with application fluid, Windex or soapy water solution.

8. Spray back side of decal with application fluid, Windex or soapy water solution.

9. Position decal in proper location. Application fluid will allow decal to be moved slightly.

10. Using a plastic squeegee or credit card. Spread decal smooth and remove all excess application fluid. Let decal set until dry enough to be able to remove transfer tape with out removing decal. Do not leave until completely dry or transfer tape will be difficult to remove.

11. Pull transfer tape from top of decal. Take care not to pull away or damage decal.

12. Finished decal installation. Work slowly and carefully and you will be rewarded with a beautifully finished model.

CENTER OF GRAVITY - CONTROL THROWS

Center of Gravity (C.G.)

4 1/2”

Back from the wing Leading Edge measured at the wing tip

Warning
Do not skip this step!

2. Balance the 50cc EXTRA 300LP ARF-QB without fuel in the tank with the batteries installed and ready to fly. The engine, radio, servos, and battery you use will determine the final weight and locations of equipment. Try to balance the model by moving the battery and receiver before adding any ballast.

Note: Model should sit level when lifted from the wing tips

3. Start at recommended CG until you are comfortable with the flight characteristics of the aircraft. You may find this a bit nose heavy at first but that is fine to start with. After you are comfortable adjust the CG to suit your flying style in small steps, especially when shifting the CG toward the tail. Move the battery or add small stick on weights to the nose or tail as necessary.

4. For aerobatic flying a more aft balance point is better. For smooth sport flying a more forward CG is better. An aircraft that is too nose heavy does not fly well and is difficult to land. A tail heavy aircraft is uncontrollable and will likely crash.

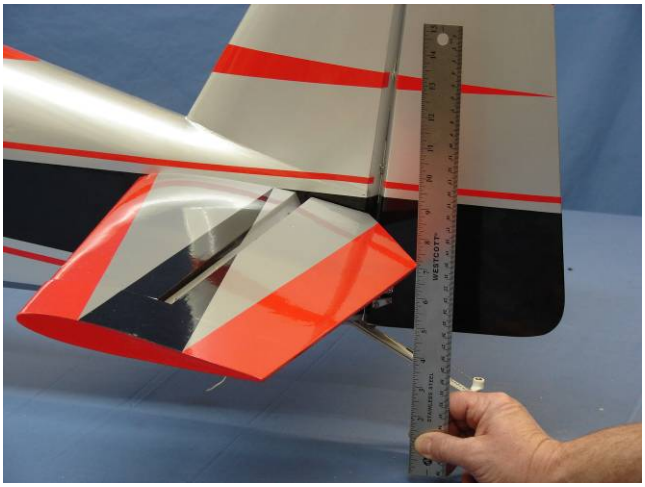
5. We have test flown the model at 4 1/4” to 4 3/4” C.G. locations and found the model to fly well at all locations. However, best flight performance was achieved at the 4 1/2” location.

Control Throws

1. The amount of control throw should be adjusted using mechanical means as much as possible and then electronically with the radio. The control throws are shown in degrees and inches of deflection measured at the widest point of the control surface for both low and high rates.

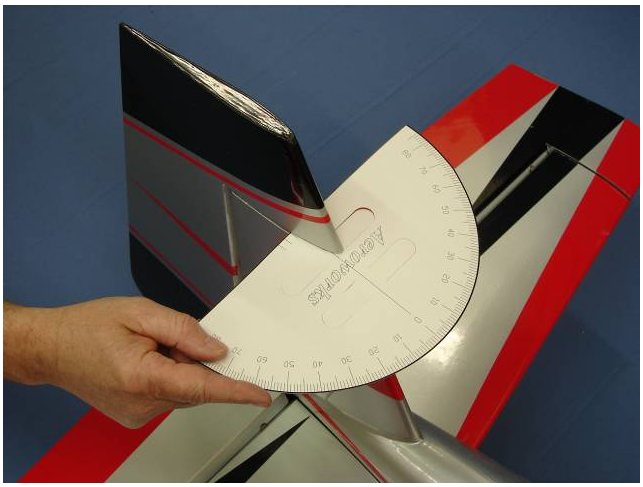
2. Use the widest part of the aileron as shown to measure the aileron throw in inches.

3. Use the widest part of the elevator as shown to measure the elevator throw in inches.

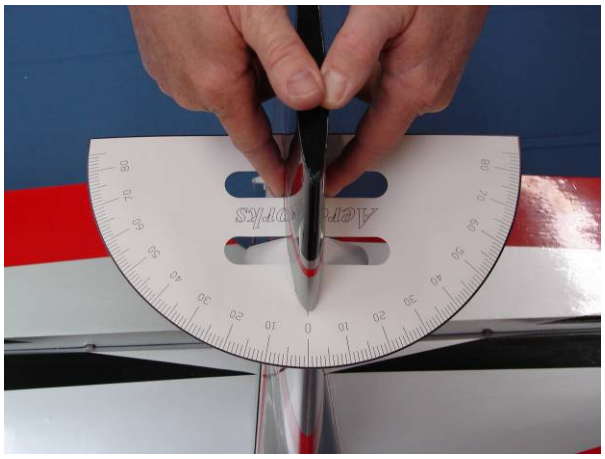


4. Gather the Rudder Throw Meter (***Supplied***) and scotch tape.

5. Slide the throw meter under the rudder boost tab.

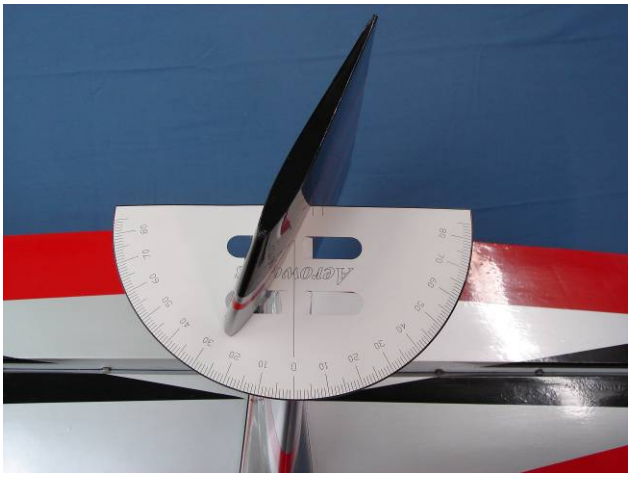


6. Center the throw meter on the rudder using the centering marks on the meter to aid with alignment. Bend the precut positioning tabs down around the fin.



7. Secure the tabs to the fin using scotch tape.

8. Degrees are measured at the tip of the boost tab as shown below.



9. Use the supplied flight control deflection meter to measure the throws in degrees. Prop up the tail of the aircraft until the fuselage is parallel to the table top.

10. Use the widest part of the aileron to measure the aileron throw in degrees.

11. Use the widest part of the elevator to measure the elevator throw in degrees..

Control Throw Deflection Table

	Low Rate	High Rate
Aileron	1 3/4" or 20˚ up	2 1/4" or 25˚ up
	1 3/4" or 20˚ down	2 1/4" or 25˚ down
Rudder	N/A" or 25˚ left	N/A" or 35˚ left
	N/A" or 25˚ right	N/A" or 35˚ right
Elevator	1 1/4" or 14˚ up	1 1/2" or 20˚ up
	1 1/4" or 14˚ down	1 1/2" or 20˚ down

For 3D flying use the following throws:

	3D Rate
Aileron	3" or 35˚ up
	3" or 35˚ down
Rudder	N/A" or 45˚ left
	N/A" or 45˚ right
Elevator	4" or 45˚ up
	4" or 45˚ down

We recommend 15% Expo on low rates, 30% expo on high rates, and 60% expo on 3D rates as a starting point. You a can adjust from there to suit your own flying style.

Preflight Checks

Center of Gravity: Check CG is set properly.

Engine: The engine should run smoothly at all throttle settings with smooth transition from idle to full throttle without stalling or hesitation. Do not fly an unreliable engine. Read engine instructions including break in and tuning completely.

Prop balancing: Ensure prop is properly balanced prior to mounting on engine.

Flight Controls: Ensure all flight controls are free from binding and are centered. Check that all hinges are tight and will not pull out. Control linkages must be rigid and tight and have no slop. Confirm proper direction of ailerons, rudder, and elevator. Experienced flyers have lost airplanes due to reversed ailerons. Right roll is right up, left down. Left roll is left up, right down.

Batteries: Transmitter, ignition and receiver batteries are fully charged.

Fasteners: Check all engine bolts, wing bolts, hatch bolts, servo screws, control horn bolts, wheel collars, and clevis keepers are tight and secure.

Covering: Check all covering and seams are sealed and secure.

Radio: Check trims set to neutral and controls centered. Check rate and condition switches set properly. Check the receiver antenna is fully extended and not reversed on it self.

Range check: Do a range check with and without the engine running in accordance with the radio manufacturer instructions. If there is insufficient range or a large reduction with the engine running, do not fly until it is resolved!

Fuel: Fill the fuel tank before each flight.

Aerobatics

The 50cc EXTRA 300LP ARF-QB is capable of any aerobatic maneuver. After you gain some confidence and little experience flying the airplane you can cut loose and perform any maneuver you can think of. Here is a list of some of the more popular aerobatic and 3D maneuvers you can try:

- Loops and rolls
- Knife edge flight
- Stall turns
- Snap rolls
- 2, 4, and 8 point rolls
- Slow rolls
- Spins upright and inverted
- Flat Spins upright and inverted
- Harriers upright and inverted
- Water falls
- Torque Rolls
- Rolling circles

The sky and your imagination are you only limits.

FLY and ENJOY!

AEROWORKS

50 cc EXTRA 300LP ARF-QB NOTES